

RASHTRAPATI BHAVAN
LIBRARY



Reg. No. 119 V.I
Clas. No. IV - B.



**PRESIDENT'S SECRETARIAT
(LIBRARY)**

Accn. No..... Class No.....

The book should be returned on or before the date
last stamped below.

INDIAN DUCKS AND THEIR ALLIES.

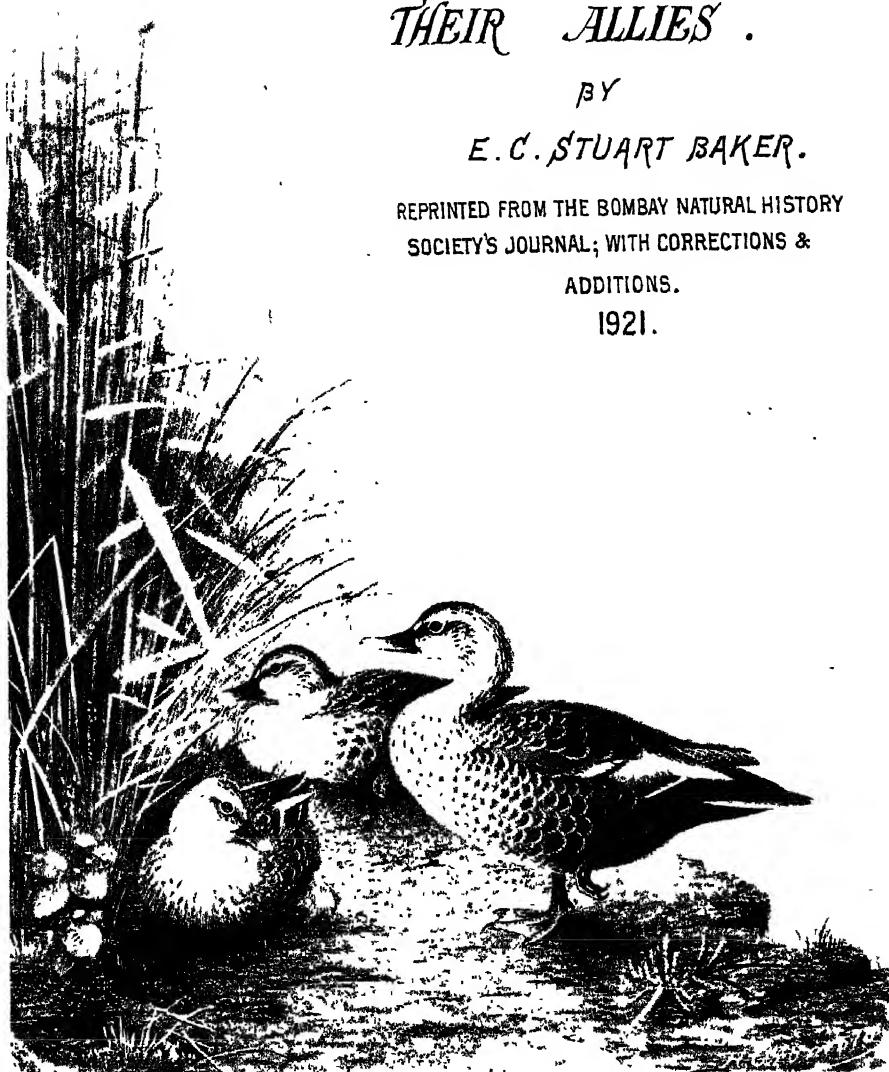
BY

E. C. STUART BAKER.

REPRINTED FROM THE BOMBAY NATURAL HISTORY
SOCIETY'S JOURNAL; WITH CORRECTIONS &

ADDITIONS.

1921.



THE GAME-BIRDS OF INDIA,

BURMA AND CEYLON

DUCKS AND THEIR ALLIES

(SWANS, GEESE AND DUCKS)

VOL. I.

BY

E. C. STUART BAKER, O.B.E., F.L.S., F.Z.S., M.B.O.U.,
H.F.A.O.U.

WITH 30 COLOURED PLATES

By H. Grönvold, G. E. Lodge and J. G. Keulemans.

SECOND EDITION.

PUBLISHED BY

THE BOMBAY NATURAL HISTORY SOCIETY.

LONDON: JOHN BALE, SONS & DANIELSSON, LTD., OXFORD HOUSE,
88-91, GREAT TITCHFIELD STREET, W.1.

1921.

LONDON ·

JOHN BALE, SONS AND DANIELSSON, LTD.

OXFORD HOUSE

88-91, GREAT TITCHFIELD STREET, OXFORD STREET, LONDON, W.1.

LIST OF CONTENTS.

						PAGE
TITLE PAGE	...	...	...	...	...	iii
CONTENTS	...	...	...	...	...	v
LIST OF PLATES	...	...	...	...	...	vii
INTRODUCTION	...	...	...	...	..	ix
BIBLIOGRAPHY	...	...	...	..		xi
INDIAN DUCKS	...	...	...	...	..	1-333
INDEX	...	...	...	...	...	335

LIST OF PLATES.

	PLATE	TO	FACE	PAGE	PAGE	PAGE	PAGE
I.	1. CYGNUS BEWICKI. Bewick's Swan 2. CYGNUS MINOR. Alpheraky's Swan 3. CYGNUS CYGNUS. The Whooper 4. CYGNUS OLOR. The Mute Swan	... ... ... ...	... ... ... ...	... ... ... ...	... ... ... ...	15	
II.	SARCIDIORNIS MELANOTA. The Nukhta or Comb-Duck	...	...	...	...	30	
III.	ASARCORNIS SCUTULATA. The White-winged Wood-Duck	...	...	...	...	41	
IV.	RHODONESSA CARYOPHYLLACEA. The Pink-headed Duck	...	...	...	...	50	
V.	NETTOPUS COROMANDELIANUS. The Cotton Teal	...	...	...	...	57	
VI.	ANSER A. ALBIFRONS. The White-fronted Goose	...	...	...	...	84	
VII.	ANSER INDICUS. The Bar-headed Goose...	...	...	...	...	101	
VIIA.	Rhamtso Lake with Nests of Bar-headed Goose and Black-necked Crane	...	...	...	...	104	
VIIIB.	Nesting Ground of Bar-headed Goose, Rhamtso Lake, Tibet, 14,000 ft.	...	...	...	...	107	
VIIc.	{ Nest of Bar-headed Goose ... Tibetans collecting Eggs of Bar-headed Geese ...	... ...	... ...	... ...	... ...	103	
VIII.	DENDROCYCNA FULVA. The Greater Whistling Teal	...	...	...	...	115	
IX.	DENDROCYCNA JAVANICA. The Lesser Whistling Teal	...	...	...	...	122	
X.	TADORNA TADORNA. The Sheldrake	...	...	...	...	133	
XI.	CASARCA FERRUGINEA. The Ruddy Sheldrake or Brahminy Duck	...	...	...	...	139	
XII.	ANAS PLATYRHYNCHA. The Common Wild-Duck or Mallard	...	...	...	...	150	

PLATE		TO PAGE
XIII.	ANAS P. PŒCILORHYNCHA. The Spot-Bill or Grey Duck	160
XIV.	EUNETTA FALCATA. The Bronze-capped Teal	172
XV.	CHAULELASMUS STREPERUS. The Gadwall	179
XVI.	MARECA PENELOPE. The Widgeon	187
XVII.	NETTION CRECCA CRECCA. The Common Teal	201
XVIII.	NETTION ALBIGULARE. The Andaman Teal	210
XIX.	DAFILA ACUTA. The Pintail	216
XX.	QUERQUEDULA QUERQUEDULA. The Garganey or Blue-wing Teal	225
XXI.	SPATULA CLYPEATA. The Shoveller	234
XXII.	MARMARONETTA ANGUSTIROSTRIS. The Marbled Duck	241
XXIII.	NETTA RUFINA. The Red-crested Pochard	249
XXIV.	NYROCA FERINA. The Pochard or Dun-bird	259
XXV.	NYROCA N. NYROCA. The White-eyed Pochard or White-eye	266
XXVI.	NYROCA N. BAERI. Baer's Pochard or Eastern White-eye	273
XXVII.	NYROCA FULIGULA. The Crested Pochard or Tufted Pochard	284
XXVIII.	OXYURA LEUCOCEPHALA. The White-headed or Stiff-tail Duck	302
XXIX.	MERGUS ALBELLUS. The Smew	309
XXX.	MERGANSER SERRATOR. The Red-breasted Merganser	317

Note.—The coloured plates in this Volume were printed by Messrs. Bale, Sons and Danielsson, Ltd., London.

INTRODUCTION.

IN 1896 and the following years I wrote a series of articles on "Indian Ducks and their Allies" in the Journal of the Bombay Natural History Society. In 1908 these articles were brought up to date, corrected and added to and appeared in book form, and so well was this volume received by the public, especially by sportsmen in India, that the edition was soon exhausted.

The first edition appeared principally to meet a want which had long been felt by Small-Game shooters in India. that is to say a volume, reference to which would not only show how each duck could be identified, but would also give some idea of its habits and its scarcity or the reverse. Hume and Marshall's "*Game Birds of India*," which was published in 1879-80, grand book as it was and is, was felt to be behind the times, and much had since been recorded in various magazines and journals. But these records were scattered here, there and everywhere, and could not be consulted without the greatest difficulty, and it was, indeed, quite impossible for anyone who had not access to a very complete library to say what had, and what had not, been recorded.

The first edition may be said not only to have served its purpose for the time being, but it served yet another and perhaps even more important one, for since its appearance a very large amount of information has been published to add to and correct its contents.

This second edition incorporates these additions and corrections, and adds a considerable amount of matter not obtainable by me when writing in India. Several species have been added to the Indian list, and the geographical distribution of certain others has been more correctly given.

Sub-species have been recognised, but, on the other hand, certain geographical races previously given the status of species have been relegated to that of sub-species. Possibly, even probably, there may be adverse comment on the recognition of sub-species or geographical races and the consequent application of trinominalism. But we cannot get over the fact that geographical races do exist, and to refuse to recognise them or to give them names to denote that we do so, will certainly not help forward the science of Ornithology. Nor does its acceptance add to the difficulty of the field naturalist and sportsman, for these are quite as anxious as the cabinet naturalist to account for the variations they find in the same species in different areas.

A further complaint which is equally sure to be raised will refer to the change in the names of many ducks which we have all known and accepted for so long. To this I have but the same answer as that which I have already repeatedly given. The names we have hitherto used are not correct, and therefore cannot be retained, and in justice to the man who first named any species that name must be used. It may inconvenience some of us of the older generation, but the newer will learn to know the bird by its correct name, and will suffer injury neither to his sentiments nor to his convenience.

The classification adopted is practically that of Blanford in the fourth volume of the Avifauna of British India. Since that book was written, some ornithologists have lumped genera together, whilst others have placed almost every duck in a separate genus. Convenience and facilities to the student seem to advise a medium course between these two, and so this has been the course adopted.

Some of the plates in the first edition have been replaced by new and better ones, and others have been improved; a fuller index has been given, and a complete list of the authors and their works referred to in the synonymy.

To facilitate reference each species has been dealt with in the same manner: (1) Synonymy, (2) Descriptions of male, female and young, (3) Distribution, (4) Nidification, and (5) General habits.

It will be noticed that in this edition the title has been altered to "The Game-Birds of India, Burma and Ceylon—Ducks and their allies (Swans, Geese and Ducks)," as this edition now forms the first volume of the series of "The Game-Birds." The second volume will be the Snipe, Bustards and Sandgrouse, just published; the third volume will be the Pheasants and the fourth the Partridges.

I have to record my very cordial thanks to the Authorities of the British Museum for the kindness with which they have allowed me to work in their galleries, for the constant assistance given to me in my work, and for placing at my disposal so vast an amount of material and so excellent a library. In this connection I would especially wish to thank Messrs. R. Ogilvie Grant and W. L. Sclater, who were in charge of the Ornithological Department during the time I was employed in revising the first edition.

LONDON,
July, 1921.

E. C. STUART BAKER.

BIBLIOGRAPHY.

ALPHERAKY, GEESE Alpheraky. 'Geese of Europe and Asia.' London, 1905.

A. M. N. H. 'Annals and Magazine of Natural History.' London, 1838-1920.

ANDERS, YUNNAN Ex. AVES. . . 'Anatomical and Zoological Researches. Results of Two Expeditions to Western Yunnan in 1868 and 1875.' London, 1878.

AS. RES. 'Asiatic Researches. Transactions of the Asiatic Society of Bengal.' Calcutta, 1829-39.

AVI. MAG. 'Avicultural Magazine.' Brighton, 1894-1920.

BARNES, B. OF BOM. 'Handbook to the Birds of the Bombay Presidency.' Calcutta, 1885.

BARR. ORN. 'Barrère Ornithologiæ. Specimen novum sive series Avium in Russinone, etc.' Perpinian, 1745.

BECHST. GEM. NAT. VOG. 'Bechstein, Gemeinnützige Naturgeschichte Deutschlands.' Leipzig, 1801-09.

BLANF. AVIFAUNA OF B. I. 'Avifauna of British India.' Oates and Blanford. London, 1889-98.

BLANF. E. PERSIA Blanford, W. T. 'Eastern Persia, Zoology and Geology.' London, 1876.

BLANF. GEOL. & FAUN. ABYSS. Blanford, W. T. 'Observations on the Geology and Zoology of Abyssinia made in 1867-68.' London, 1870.

BLYTH, CAT. Blyth. 'Catalogue of Birds in the Museum Asiatic Society.' Calcutta, 1849.

BLYTH, BIRDS OF B. Blyth, E. 'Catalogue of Mammals and Birds of Burma.' Hertford, 1875.

BLYTH & WALD. BIRDS OF B. Blyth, E. 'Catalogue of Mammals and Birds of Burma' (reprint from the 'Journal of the Asiatic Society of Bengal'). Hertford, 1875.

BONAP. CONSP. AV. Bonaparte, C. L. 'Conspectus Generum Avium.' Lugduni Batavorum, 1850.

BULL. B. O. C. 'Bulletin of the British Ornithologists' Club.' London, 1892-1920.

BULL. SOC. PHILOM. 'Bulletin Société Philomatique.' Paris, 1791-1920.

BUTLER, CAT. B. OF S. Butler, E. A. 'Catalogue of the Birds of Sind, Cutch, Kathiawar, North Guzerat and Mt. Aboo, etc.' Bombay, 1879.

BUTLER, CAT. B. OF S. B. PRES. Butler, E. A. 'Catalogue of the Birds of the Southern Portion of the Bombay Presidency.' Bombay, 1880.

CAT. B. M. 'Catalogue of Birds in the British Museum,' i-xxvii. London, 1874-98.

DRESSER, PAL. BIRDS Dresser, H. E. 'Manual of Palæoarctic Birds.' London, 1902-03.

DRESSER, EGGS OF E. B. Dresser, H. E. 'Eggs of the Birds of Europe.' London, 1905-10.

EMU Official organ of the Australian Ornithologists' Union—a quarterly magazine to popularize the study and protection of native birds. Melbourne, 1901-20.

GEORGI Georgi, J. G. 'Bemerkungen einer Reise im Russischen Reich im Jahre, 1772.' St. Petersburg, 1775.

GLEANINGS IN SCIENCE 'Gleanings in Science.' Edited by Capt. J. D. Herbert and J. Prinsep, vols. i-iii. Calcutta, 1829-31.

GMELIN, SYST. NAT. Caroli, A. Linné. 'Systema Naturæ.' Leipzig, 1788.

GMELIN, REIS. Gmelin, J. G. 'Reise durch Sibirien, 1738-43.' Göttingen 1751-52.

GOULD, B. OF ASIA 'The Birds of Asia.' London, 1850-83.

GRAY, CAT. Gray. 'List of Specimens of Birds in the British Museum.' London, 1848-68.

GRAY, CAT. M. & B. NEP. PRES. Gray. 'Catalogue of Specimens of Mammals and Birds of Nepal and Tibet.' Presented by B. H. Hodgson to the British Museum. London, 1846.

GRAY, LIST OF B. Gray. 'Hand-List of Genera and Species of Birds in the British Museum.' London, 1869-71.

GUNNER 'Gunnerus in Leem Beskr.' Finin Lapp, 1767.

HARTERT, VOG. PAL. 'Die Vogel der palaarktischen Fauna.' Berlin, 1903-20.

HUME & MARSH. GAME-B. 'The Game Birds of India, Burma and Ceylon.' Vol. i-iii, 1879-80.

HUME, NEST AND EGGS 'Nest and Eggs of Indian Birds.' Calcutta, 1878.

JERDON, B. OF I. 'Jerdon, Birds of India.' Vol. i-iii. Calcutta, 1862-64.

J. B. N. H. S. 'Journal Bombay Natural History Society.' Bombay, 1886-1920.

J. F. O. 'Journal für Ornithologie.' Cassell, 1853-1920.

KEYSERLING & BLASIUS, WER-BELTHIERE Keyserling, A. F. M. L. A. & Blasius, J. H. 'Die Werbelthiere Europas.' Braunschweig, 1840.

LATHAM, IND. ORN. 'Index Ornithologicus.' London, 1790.

LATHAM SYN. 'General Synopsis of Birds, London, 1781-1885.

LEGGE, B. OF C. Legge. 'A History of the Birds of Ceylon.' London, 1880.

LINN. S. N. 'Linnæus, Systema Naturæ.' 10th edit. Leipzig, 1758.

LINN. FAUN. SVEC. 'Linnæus, Fauna Suecica.' Lugduni Batavorum, 1746.

MAD. JOUR. ' Madras Journal of Literature and Science.' Madras, 1833-82.

MÉNÉTRIÉS, CAT. REISE . . . Ménétriés. ' Catalogue raisonné des Objects de Zoologie dans un voyage au Caucase et Perse.' St. Petersberg, 1832.

MÜLLER, LAND EN VOLK. . . . ' Müller. Land en Volkenkunde.' 1839-45.

NAUM. VOG. DEUTSCH. . . . ' Naturgeschichte der Vogel Deutschlands.' Leipzig, 1820-44.

OATES, B. OF B. B. . . . ' Handbook to the Birds of British Burma.' London, 1883.

OATES, CAT. EGGS B.M. . . . ' Catalogue of Eggs in the British Museum.' London, 1901-12.

OATES, MAN. GAME B. . . . ' A Manual of the Game Birds of India.' Parts I and II. Bombay, 1899.

PALLAS, REISE. ' Reise durch verschiedene Provinzen des Russischen Reichs.' St. Petersberg, 1773.

PENNANT, IND. ZOOL ' Pennant, Indian Zoology.' 1st edit., London, 1769 ; 2nd edit., London, 1790.

P. A. S. B. ' Proceedings of the Asiatic Society of Bengal.' Calcutta, 1866-80.

P. Z. S. ' Proceedings of the Zoological Society of London.' London, 1830-1920.

SCOP. ANN. ' Annus Historico Naturalis.' Lipsia, 1769-1772.

SEVERTZ TURKES JEVOTN 'Vertikal'noe i ghorizontal'noe raspredylenie Turkestanskikh Zhivotnuikh.' Moscow, 1873.

SHARPE, HAND-L. 'Sharpe. Hand-List of the Genera and Species of Birds,' vols. i-v. London, 1899-1909.

SPOILIA ZEYLANICA 'Spoilia Zeylanica.' Colombo, 1908-1920.

STEPHENS, GEN. ZOOL 'Stephens. General Zoology.' 'Birds,' vols., ix-xiv. London, 1809-26.

S(tray) F(eathers) 'A Journal of Ornithology for India and its Dependencies.'

STUART BAKER Stuart Baker. 'Indian Ducks and their Allies.' London, 1908.

SEMM. MAN. 'Manual d'Ornithologie.' Amsterdam, 1815.

TRANS. L. S. 'Transactions of the Linneæn Society of London.' London, 1791.

VIEILL. NOUV. DICT. D'HIST. NAT. 'Vieillot Nouveau Dictionnaire d'Histoire Naturelle.' Paris, 1816-19.

Order CHENOMORPHÆ.

The characteristics of this order, as defined by Huxley, are: palate desmognathous; young covered with down and able to run or swim in a few hours after hatching.

The order is divided into three suborders, but with the first of these—the “Palamedæ, or Screamers”—we have nothing to do, as they are confined to the Neotropical Region and do not visit our part of the world.

The two remaining suborders are the Phœnicopteri, or Flamingoes, and the Anseres, or true Swans, Geese, and Ducks. There can be no chance of these two being confounded by anyone, as the two forms are so widely different.

Key to Suborders.

- A. Tarsus three times the length of femur; bill strongly bent downwards in the centre *Phœnicopteri.*
- B. Tarsus about the same length as the femur; bill not bent, but straight *Anseres.*

The suborder Phœnicopteri contains but one family—the *Phœnicopteridæ*—and that family (so far as we are concerned) but two genera, both of which contain but a single species.

Key to Genera.

- A. Upper mandible overlapping lower; throat naked . . *Phœnicopterus.*
- B. Upper mandible not overlapping; throat feathered . . *Phœniconaias.*

Suborder PHÆNICOPTERI.

Family PHÆNICOPTERIDÆ.

(1) PHÆNICOPTERUS ANTIQUORUM.

THE FLAMINGO.

Phœnicopterus antiquorum, *Temm. Mann.* 2nd Edit. ii, p. 587 (1820); *Holdsw. P. Z. S.* 1872, p. 479 (Ceylon); *Lloyd, Ibis*, 1873, p. 419 (Kathiawar); *Hume, S. F.* vii, p. 491 (1879); viii, pp. 114, 949 (1879); *Barnes, B. of Bom.* p. 392 (1885); *id. J. B. N. H. S.* vi, p. 285 (1885); *Lister, J. B. N. H. S.* viii, p. 553 (1893).

Phœnicopterus roseus (*Barr. Orn. Class.* 1, p. 21 (1745)); *Blyth, Cat.* p. 299 (1849); *Layard, A. M. N. H.* xiv, p. 268 (Ceylon); *Adams, P. Z. S.* 1858, p. 50 (Punjab); *Jerdon, B. of I.* iii, p. 775 (1864); *Hume, Ibis*, 1870, p. 142 (Sambhur Lake); *Hume, S. F.* i, p. 257 (1873) (Sindh); *Legge, Ibis*, 1875, p. 407 (Ceylon); *Butler, S. F.* iv, p. 25 (1876) (N. Guzerat); *Fairbank, ibid.* p. 264 (Dukhan); *Butler, ibid.* v, p. 234 (N. Guzerat), p. 287 (Gulf of Oman) (1877); *Davids. & Wend. S. F.* vii, p. 92 (1878) (Deccan); *Murray, ibid.* p. 112 (Sindh); *Vidal, ibid.* ix, p. 91 (1880) (S. Konkan); *Butler, ibid.* p. 436 (Deccan); *Legge, B. of C.* p. 1092 (1880); *Parker, Ibis*, 1886, p. 188 (Ceylon); *Reid, S. F.* x, p. 78 (1887) (Lucknow); *Davids. ibid.* p. 325 (1887) (W. Khandeish); *Hume, ibid.* p. 513 (not breeding in India); *Salvad. Cat. B. M.* xxvii, p. 12 (1895); *Stuart Baker, J. B. N. H. S.* xi, p. 2 (1897) (full syn. and descrip. &c.); *Fleming, J. B. N. H. S.* xii, p. 216 (1898) (Tinnevelly dist.); *Blanford, Avifauna B. I.* iv, p. 408 (1898); *Oates, Cat. Eggs, B. M.* ii, p. 136 (1902); *Rao Khengarji, J. B. N. H. S.* xv, p. 706 (1904) (Photo); *Inglis, J. B. N. H. S.* xviii, p. 683 (1908) (Darbhanga Dist., Tirhoot); *Stuart Baker, Indian Ducks*, p. 2 (1908); *Tenison, J. B. N. H. S.* xix, p. 525 (1909) (Mardan, N.W. Frontier); *Whitehead, J. B. N. H. S.* xxi, p. 170 (1911) (Sehore, C. India); *Radcliffe, J. B. N. H. S.* xxiv, p. 167 (1915) (Baluchistan); *Whistler, Ibis*, 1916, p. 115 (Jhelum Dist.).

Phœnicopterus ruber, *Sykes (nec Linn.) P. Z. S.* 1832, p. 159 (Dukhun); *Hartl. J.f.o.* 1854, p. 160 (Ceylon).

Phœnicopterus europæus, *Jerdon, Mad. Journ.* xii, p. 217, No. 373 (1840).

Phœnicopterus antiquus, *Blyth, Cat. S. B.* p. 299 (1849).

Phœnicopterus andersoni, *Brooks*, *P. A. S. B.* 1875, pp. 17-48 (Futteh-gurh); *Hume*, *S. F.* iii, p. 414.

Le Flammant Rose, Magaud d'Aubusson in 'Le Naturaliste' (2), xx, pp. 191-192, 206-208 (1906).

Description. Adult Male.—Whole plumage, with the exceptions noted, a beautiful rosy-white, the rose-colour much more developed on the tail and rather more on the head and neck; primary-coverts nearly or quite white, other wing-coverts and innermost secondaries light rose-red; primaries and outer secondaries black; under wing-coverts and axillaries scarlet; under median and primary-coverts black.

Colours of soft parts.—Orbital skin flesh-pink to bright red; irides lemon-yellow, pale yellow, or pale golden-yellow (*Jerdon*); bill bright flesh-coloured, edge of mandible and terminal portion of bill black; legs and feet pinkish-red, claws black.

Measurements.—Length varies from 44 to 53 inches, wing 15·15 to 17·5, tail 6 to 7·5, tarsus about 13, bare part of the tibia 9, culmen 5·5 to 6·4, depth (of bill) at centre 1·5. (*Legge, B. of Ceylon*.)

Female.—Similar to the male, the rose-colour on head, neck and back often less pronounced, but not always so. Length from 38 to 48 inches, wing 14·3 to 15·8, tail 5·5 to 6·8, tarsus about 10·5 to 11·5, bare tibia about 7, culmen 4·75 to 5·6.

Young.—Head, neck and lower plumage white, more or less tinged with rosy-buff; back and wing-coverts ashy-buff, with dark shaft-stripes; the greater coverts more brown, but with pale tips soon wearing off; under wing-coverts and axillaries pale-pink; bill more dull than in adults; legs dark-plumbeous.

Nestling.—White down, more or less tinged with grey, especially on the upper parts; down in texture like that on a young swan (*Dresser*). In the nestling the bill is perfectly straight, but soon assumes the normal shape.

Distribution.—Southern Europe (practically confined to the coastline), Asia on the east and south-east, and the whole of Africa.

In India the Flamingo is found more or less throughout the continent, but I can find no record of its ever extending to Burma, and in Hume's collection there are none from the east of Bengal or Assam, though from the latter place there is in the British Museum collection one skin marked "x. Juv. sk. Assam," obtained by McClelland. It is very common on the major part of the west coast, and extends quite down to Ceylon, where Legge states that it is seen in large numbers, both on the west and east coast. Thence it extends northwards, and is common in certain parts of Madras, but in Eastern

Bengal is a decidedly rare bird. I have once seen it during the cold weather in the Sundarbands, and there are a few other recorded instances. In the widely-known and shot-over Chilka Lake, in Orissa, it is fairly frequently met with, though I hear less frequently and in smaller numbers than formerly, probably owing to the lake being more accessible to sportsmen now-a-days than it used to be. Elsewhere in Bengal it is only a casual flock that is seen in the cold weather.

Nidification.—Legge seems to have thought that the Flamingo bred in Ceylon; but his ideas on this subject have never been confirmed, though it is more than possible that he was correct, as Mr. W. N. Fleming reports from Tuticorin that the Flamingo is fairly common throughout the district, and that a large flock, numbering some 300 birds, was still in the neighbourhood of that place in July, 1898.

His Highness the Rao of Cutch is the only observer who has actually found a regular nesting-place of the Flamingo within Indian limits. In a letter to Mr. Lester he recorded that he had obtained some twenty eggs and two young from some place in the Runn of Cutch.

Later he writes :—

“ It appears that they breed fairly regularly on the Rann, except in seasons of scanty rainfall, when there is very little or no water lying on that tract, as has been during the recent years of scarcity and famine, or when the rains do not arrive until very late in the year. Their nests, which are built of mud, whilst the earth is wet, are not made on any particular island; but the birds seem to select ground slightly higher than the surrounding country, and covered with shallow water on all sides to a considerable distance from the spot selected, evidently to be free from danger from jackals, wolves, etc. It would be worth knowing if the Flamingoes in seasons which they find unfavourable for nesting on the Rann seek other safer breeding-grounds, and, if so, whether they breed then on the Mekran coast or elsewhere, or whether in such years they do not breed at all. A few of the birds are always to be seen in these parts. This year a large number of eggs and three young birds not fully fledged have been brought to me. The place on the Rann where the nests were found is about eight miles to the north-east of the Pachham, and here the nests were to be seen in hundreds.

“ A photograph was taken on the 6th November, 1903, but the birds breed earlier than that. The eggs found on the nests were all bad ones.”

Its principal breeding-places lie in Africa, and in Arabia and Persia, where it collects during the breeding season in countless numbers. It also breeds in Spain, and is said to do so in the Rhone Delta. Hume, and after him, Barnes (J.B.N.H.S. vi., No. 3, p. 285) have commented on the curious and untidy habit these birds possess of dropping eggs about in a casual sort of manner, and in this way a good many have been found in India.

Other ornithologists have noted this habit, and it seems to be one common to the whole genus, as Barnes notes having obtained eggs thus which he considered belonged to the Lesser Flamingo.

Again, my friend Dr. E. Hartert, when visiting Bonaire, came across a colony of Flamingoes breeding; and, though he could not approach near enough to obtain specimens and satisfy himself as to the species, he managed to visit the nesting-places, and he mentions that he obtained two fresh eggs which were lying in the water. Here the birds do not seem to have commenced breeding in earnest, and these eggs appear to have been casually dropped by them into the water, either before the nest had been made to receive them, or, more likely, before the birds felt inclined to commence incubation.

All kinds of flamingoes, of which the nidification is known, breed in large communities, and seem to select much the same kind of country—sheets of water, wide in extent, but very shallow—as the sites in which to make their nests. These are inverted cones of mud, some twelve or eighteen inches high, with the ends flattened off and a shallow cavity made in their summits. The nests are made close together, in many cases several in a group, almost touching one another; but of course their proximity to each other depends greatly on the depth of the water in which they are placed. Where this is variable the nests will be found in close clusters in the shallower parts, sometimes even on mud- or sand-banks above water-level. Where the water is all shallow—such as is found in the Rhone Delta, Spain, and elsewhere—the nests are scattered casually over a considerable extent of land. In Bonaire the land on which the birds had made their nests was not of mud or sand covered by water, but of coral. Hartert's own words describe the place vividly for us; he says:—

"The water was deep in places and the bottom very rough, consisting of very sharp corals and often of a deceitful crust of salt or saltpetre, under which the water was black and very deep. It required much care to avoid these places, and it took us over an hour to reach the nests. The nests themselves were flat plateaus standing out of the water from three to six inches, the water round them being apparently very shallow; but it was often the fatal crust that caused this appearance, not the proper bottom. Many of the nests were close together, and some of them connected by dry ground. They were quite hard, so that one could stand on them, and almost the only way of getting along was to jump from one nest to another. The nest consisted of clay, hardened by the sun and penetrated and encrusted with salt and pieces of coral, with a distinct concavity in the centre."

The eggs, nearly invariably two in number, are long ovals, generally a good deal pointed at the ends. The colour of the true shell is a pale skim-milk blue; but they are so encrusted with a dense chalky covering that they appear, except where stained, to be pure white. They vary in size very considerably, but average about $3\cdot 6 \times 2\cdot 3$ inches.

General Habits.—Although so common in many parts of India, Flamingoes are nowhere easy to get shots at, as they are extremely wary and cute birds. All over their habitat shyness seems to be their most prominent characteristic, and a close approach means the result of a stalk as carefully made as if the stalker were after the wildest kind of deer or antelope. A mistake made in attempting to conceal one's-self, and the whole flock rise gracefully into the air and remove themselves into safety. Typically their formation in flight is distinctly anserine, not perhaps exactly V-shape, but more in the form of a curved ribbon, the ends fluttering backwards and forwards as the birds, more especially those at the two extremes, alter their position. As a matter of fact, different writers have declared the bird's flight to vary very much. Some have said that in no respect does the flight of these birds resemble that of ducks or geese, but that, rising in one indiscriminate mass, they continue their flight as they rise; others, on the other hand, say that the formation they assume is nearly as regularly V-shaped as that adopted by geese. Both accounts are doubtless right, and it seems probable that when flying for a short distance only they adopt no special mode of

flight, whereas on migration, or when moving to any distance, their formation is much as already described.

Flying or wading they are a lovely sight, and, often as they have been described, no one has yet been able to do justice to their beauty. In December, 1881, when passing through the Suez Canal, I observed more of these birds congregated together than I had ever considered possible, the banks in some places looking as if they were covered with a rosy snow, so densely were the birds packed. As the steamer gradually approached nearer and nearer, the snow melted on its outskirts into a crimson flame as the birds lifted their wings on taking flight, and in so doing exposed their scarlet coverts and axillaries. They made but little noise, the few calls that were heard being very similar to those of a wild goose, but not perhaps quite so discordant.

Writing of these birds, Dr. Eagle Clarke ('Ibis,' 1895, p. 200), says :—

"To witness the simultaneous unfolding of a thousand lovely crimson and black pinions under brilliant sunlight is a sight, the recollection of which will not readily be effaced from our memories. The flock did not run forward to rise on the wing, but we noticed that they deliberately turned and faced a gentle breeze that was blowing and rose with perfect ease. We several times noticed the whole herd on the wing, but in no instance was any particular formation maintained."

They do not, however, at least in this country, always rise in the same manner, but both before rising and after alighting run forward some steps in a most ungainly manner.

They generally leave Northern India in May or June, though they have been seen in July, and the first few birds return in the end of September. From Southern as well as from Eastern India they migrate a good deal earlier as a rule, but they have been recorded in Ceylon in May, and, as mentioned above, from Tuticorin in July.

As might be expected from the very curious formation of the bill, their mode of feeding is rather remarkable. Bending down their long necks between their legs, and looking very much like bird acrobats preparing to stand on their heads, they invert their bills entirely, and use them as shovels in which to catch or collect

their food. This they obtain by moving their heads backwards and forwards, or from side to side, and gently stirring up the mud. What they actually feed on is not at all well-known, and is one of the easy points still left for sportsmen to clear up, as it only means the examination of the internal economy of a few birds shot whilst they are in the act of feeding. We know that a considerable part of their diet is vegetable, but they are also in all probability far more given to animal food than has generally been believed to be the case. Dr. Eagle Clarke, in his interesting article already referred to, came to the conclusion that the Flamingoes inhabiting the Rhone Delta existed almost entirely, if not quite, on a tiny Phyllopod, the brine-shrimp (*Artemia salina*), which he states is found there in marvellous abundance.

The value of the Flamingo when divested of its feathers and placed on the table has been variously estimated. Some have said that skinned and well-cooked it is equal to almost any duck in flavour, whilst, though few abuse it as fishy or nasty in any way, many have said and written that the flesh is black, flavourless, and stringy. Probably, as with so many true ducks, it depends greatly on the bird's diet and the length of time it has had to recover from its migratory flight. Doubtless birds just arrived, wanting food, and not very particular as to what they eat, are tough, and may acquire almost any taste. On the other hand, those that have had a good time to rest and gain flesh at the expense of muscle are tender, and those that have lived on a good diet are also well-flavoured.

(2) PHœNICONAIAS MINOR.

THE LESSER FLAMINGO.

Phœnicopterus minor, *Geoffr. Bull. Soc. Philom.* i, ii, p. 98, figs. 1-3 (1798); *Jerd. Mad. Jour.* xii, p. 217 (1840); *Blyth. Cat.* p. 299 (1849); *id. Ibis*, 1867, p. 174; *Jerd. Ibis*, 1869, p. 231 (Delhi); *Hume, ibid.* p. 355; *Hume, S. F.* i, pp. 31, 258 (1872); *Adams, ibid.* p. 400 (1873) (Sambhur Lake); *ib. ibid.* ii, p. 339 (1874), (Sambhur); *Hume, ibid.* iv, p. 25 (1875) (N. Guzerat); *Butler, ibid.* v, p. 234 (1872) (N. Guzerat); *Hume, ibid.* viii, p. 114 (1879); *Butler, ibid.* ix, p. 436 (1880) (Deccan); *Legge, B. of C.* p. 1093 (1880) (N.W. India); *Hume, S. F.* x, p. 513 (1887) (not breeding in India); *Barnes, B. Bom.* p. 393 (1885); *Betham, J. B. N. H. S.* xii, p. 222 (1898); *Blanford, Avifauna B. I.* iv, p. 410 (1898); *Rao Khengarji, J. B. N. H. S.* xix, p. 262 (1909) (Cutch).

Phœnicopterus blythi, *Bonap. Conspl. Av.* ii, p. 146 (1857).

Phœnicopterus roseus, *Jerd. B. I.* iii, p. 775 (1864) (part).

Phœnicopterus rubidus, *Feilden, Ibis*, 1868, p. 496; *Gray, Ibis*, 1869, p. 442.

Phœniconaias minor, *Salvad. Cat. Birds B. M.* xxvii, p. 18 (1895); *Stuart Baker, J. B. N. H. S.* xi, p. 8 (1897) (full syn. descrip. &c.); *Oates, Cat. Eggs B. M.* ii, p. 137 (1902); *Stuart Baker, Indian Ducks*, p. 7 (1908); *Fenton, J. B. N. H. S.* xx, p. 221 (1910) (Kathiawar); *Mosse, ibid.* p. 518 (1910) (Kathiawar).

Description. Adult Male.—General colour a bright pale-pink; feathers at the base of the bill crimson; the longest scapularies and median wing-coverts crimson, the latter edged paler; other wing-coverts and the edges of the under wing-coverts rosy, the greater under wing-coverts and quills black; axillaries crimson; rectrices darker and with the outer webs tinged with crimson; under tail-coverts subtipped with a tinge of crimson. Some old males, perhaps during the breeding-season only, have the feathers of the back with crimson shaft-stripes.

Colours of soft parts.—Iris red minium; bill dark lake-red, with the tip black; feet red (*Antinori*).

Measurements.—Length 34 to 38 inches, wing 13 to 14, tail about 5, culmen 4 to 4'25, tarsus 7'5 to 8'25.

Female.—Similar to the male, but smaller and paler, without the crimson scapularies, and with no crimson on the back or breast.

Measurements.—Length about 32 to 34 inches, wing 12'2 to 13, tail about 5 or less, culmen about 4, tarsus about 7'25.

The Young appear to be very like that of *Phoenicopterus roseus*, but with a more rosy and less brown or buff tinge; altogether brighter, paler birds.

Distribution.—This bird is not spread over nearly so large an area as is the Common Flamingo. It appears to extend through South Africa on both coasts, but the extent of its range northwards on the West Coast is still doubtful. In the British Museum Catalogue, Salvadori marks its habitat Senegal with a “?.” In the east it is found on many parts of the coast as far north as Abyssinia, and also in Madagascar. From N.E. Africa it extends to N.W. India, where, however, it is not found far south or far into the interior, nor is it found anywhere towards the east.

Nidification.—It has been recorded from various parts of India from the end of September up to the beginning of July, and cannot breed very far from our shores. In all probability most of the birds which visit us breed on the west coast of the Red Sea, and if such is the case there would be nothing very remarkable in the shortness of the time elapsing between the departure of the last birds and the arrival of the earliest ones in the following September and October.

It is, however, also just possible that the Lesser Flamingo may actually breed with us, as General Betham in 1899 obtained in Baroda eggs which I think were certainly those of a flamingo, and probably those of the smaller species. Captain Cox, who took the eggs, wrote: “Found at Badalpur, on the north bank of the Mahi at its mouth. No nest. Eggs deposited on a mound or small island in brackish water. Another clutch of six existed, but were taken by Muggurs.”

These eggs were, if I remember rightly, sent to me to look at, and differed from other flamingoes' eggs in having practically none of the chalky covering such as is usually found on these.

The only note besides Betham's I can find regarding the nidification of this flamingo is that made in the 'Journal of the B.N.H.S.' by the late E. Barnes, who says that he obtained an egg from a fisherman, who found it on a sand-bank in the Indus. This egg, from its very small size, he believed to have belonged to the present

species, and he adds that he examined the huge series of flamingo eggs in the Frere Hall Museum, Karachi, but failed to detect any so small. There is no reason why the egg should not belong to *P. minor*, and Barnes was so careful in the statements he made, that this egg is more likely to belong to that bird than to *P. roseus*.

General Habits.—It seems likely that none of the various species of flamingoes migrate to any great distance, and some, as we know, are practically permanent residents in the countries they inhabit. In Vol. vi. of 'Stray Feathers' Hume has the following note on this beautiful bird :—

" We know but little yet of this species. I ascertained that it occurred in Scind in the early part of the hot weather. Captain Feilden shot it in July in Secunderabad. It has been seen on the great Majuffgarh Jheel, twenty miles north of Delhi, during the cold season; and Mr. Adams has given us full accounts of its occurrence in great numbers, but irregularly, at the Sambhar Lake. We have no record of its occurrence in any other part of Jodhpore, or in Kutch, or in Kathiawar."

In habits, the Lesser Flamingo seems to differ in no way from its larger cousin, and is just as wary a bird as the latter. It is on the Sambhar Lake alone, perhaps, that it has, as a species by itself, been observed in any number in India. There it was found to be an extremely wide-awake bird. Even in the middle of the day it rested well away from all cover, and was most difficult of approach. It feeds in the manner usual to the genus—that is to say, in groups, the formation of which is generally a long line. This line slowly advances through the shallow water, the long necks of the birds covering a radius of some two feet or so, as heads downwards they shovel and rake about in all directions in search of food.

Suborder A N S E R E S.

Family ANATIDÆ.

Key to Subfamilies.

A. Hind-toe not lobed.

- a. Neck as long as, or longer than, the body . . . 1. CYGNINÆ.
- b. Neck not as long as body.
- a'. Hind-toe rather long, tail-feathers rather long.
 - Upper parts glossy 2. PLECTROPTERINÆ.
- b'. Hind-toe moderate, tail-feathers rather short.
 - Upper parts not glossy. No cere . . . 3. ANSERINÆ.

B. Hind-toe very narrowly lobed.

- c. Bill short and goose-like 4. CHENONETTINÆ.
- d. Bill rather flat and broad 5. ANATINÆ.

C. Hind-toe broadly lobed.

- e. Bill more or less depressed.
- c'. Tail-feathers normal 6. FULIGULINÆ.
- d'. Tail-feathers narrow and very stiff 7. OXYURINÆ.
- f. Bill more or less compressed, never depressed . 8. MERGINÆ.

Subfamily CYGNINÆ.

This subfamily contains but one genus (*Cygnus*) which is represented in India, the other two genera, *Chenopis* and *Coscoroba*, being confined to Australia and South America respectively.

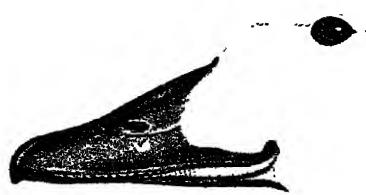
The swans are so easily identified by the veriest beginner, that it is not necessary to add anything to the above key, though there are a good many other distinctions they possess, besides the one named, interesting only from a scientific point of view.

In 1897, when I was writing a series of articles on 'Indian Ducks and their Allies,' it was very doubtful what species of swans had been obtained in India; but I then accepted records of *Cygnus musicus* (*Cygnus cygnus*), *C. bewicki* and *C. olor*. Of these, however, the second had to be eliminated, as Blanford showed that the head and feet, hitherto supposed to have belonged to this species, were really those of *C. cygnus*. Ten years later, in 1908, when these articles to which I refer appeared in book-form, there were, therefore, only two species of swans, i.e., *cygnus* and *olor*, the Whooper and the Mute Swan, which had been authenticated as having occurred in India. Since then a great deal more information has been obtained on the occurrence of swans in that country and, in addition to this, Alphéraky has described a new eastern form under the name *jankowskii*; it seems, therefore, desirable to again examine the question of what swans have occurred in India, and at the same time it may be useful to summarise all information up to date and give a key to the species. The correct name for *Cygnus musicus* is *Cygnus cygnus*, and will be used hereafter in this article.

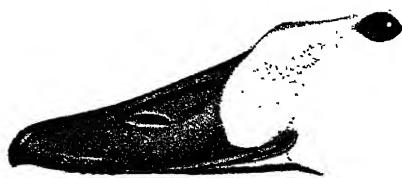
Oberholser, in a synopsis of the genera and species of *Cygninæ* which appeared in the 'Emu,' divided the swans into different genera, and if we follow him our Indian swan visitors would have to be divided into two, *Cygnus* representing those swans possessing a knob on the bill and *Olor* those without. As such a division helps neither the student nor the sportsman to distinguish the swans from one another, it appears unnecessary to follow him, and I therefore retain but the one genus, *Cygnus*.

Key to the Species.

- A. Lores and triangular patch between forehead and gape yellow or orange-yellow, never black. No knob at base of bill.
 - a. Yellow on bill extending right up to the nostril and sometimes still further towards tip of bill. *cygnus.*
 - b. Yellow never reaching to nostril and generally confined to somewhat circular patch on base.
 - a'. Bill longer, broader but less high at the base in comparison. Serrations hardly visible on bill when closed *minor.*
 - b'. Bill shorter, not so broad but comparatively high at base. Serrations visible along nearly whole length of bill when closed *bewicki.*
- B. Lores and triangular patch black. A knob at base of bill in adults *olor.*



1.



2.



3.



4.

1. BEWICK'S SWAN. C. bewickii.

2. ALPHERAKY'S SWAN. C. minor.

3. THE WHOOPER. C. cygnus.

4. THE MUTE SWAN. C. olor.

$\frac{1}{2}$ nat size.

(3) CYGNUS CYGNUS.

THE WHOOPER.

Anas cygnus, *Linn. S. N. ed. 10*, i, p. 122 (1758) (Sweden); *ibid* i, p. 194 (1766); *Lath. Ind. Orn.* ii, p. 893 (1790).

Cygnus ferus, *Briss. Orn.* vi, p. 292, pl. 28 (1760).

Cygnus musicus, *Bechst. Gem. Naturg. Vog. Deutsch.* iii, (?) iv, p. 830, pl. 35 (1809) (Thuringia); *G. R. Gray, Cat. M. & B. Nep. Pres.* 1846, p. 144; *Brooks, P. A. S. B.* 1872, p. 63; *Hume, S. F.* vii, pp. 106, 107, 464; viii, p. 114; *id. Cat. No. 944, quat.*; *Hume & Marsh. Game-B. Ind.* iii, p. 47, pl. (1880); *Salvadori, Cat. B. M.* xxvii, p. 27 (1895); *Stuart Baker, J. B. N. H. S.* xl, p. 2 (1897); *Blanford, ibid.* p. 306 (1898); *id. Avifauna B. I.* iv, p. 414 (1898); *Aitken, J. B. N. H. S.* xiii, p. 362; *Oates, Man. Game-B.* ii, p. 35 (1899); *Crerar, J. B. N. H. S.* xv, p. 716 (1903); *Cumming, ibid.* xvi, p. 697; *Makin, Ibis*, 1906, p. 398; *Annandale, ibid.* p. 612; *Buturlin, ibid.* p. 737; *Thomson, ibid.* 1907, p. 511 (Seistan); *Buturlin, ibid.* p. 651; *Stuart Baker, Indian Ducks*, p. 12, pl. 1, fig. 1 (1908); *id. J. B. N. H. S.* xviii, p. 754 (1908); *Osborn, ibid.* xix, p. 263 (1909) (Hoshiarpur Dist.); *Millard, ibid.* xx, p. 1181 (1911) (Soham R., Punjab); *Kinnear, id. ibid.* p. 1184 (Nowshera); *Stuart Baker, ibid.* xxi, p. 274 (1911) (Kabul R.); *Meinertzhagen, Ibis*, 1920, p. 181 (Quetta).

Cygnus bewicki, *Hume & Marsh. Game-B. Ind.* iii, p. 51 (in err.) (1880); *Stuart Baker, J. B. N. H. S.* xi, p. 14 (in err.) 1897; *Salvadori, Cat. B. M.* xxvii, p. 29 (1895), part, specimen "m."

Cygnus cygnus, *Sharpe, Hand-L.* i, p. 207 (1899); *Stuart Baker, J. B. N. H. S.* xxiii, p. 455, pl. fig. 3 (1915).

Olor cygnus, *Oberholser, Emu*, viii, p. 6 (1908).

Description.—*Cygnus cygnus* can be discriminated from the other swans which have yellow lores, by its much greater size when adult, the wing being never under 22·5 inches (= 570 mm.) and generally a good deal more. The bill is not only actually, but also comparatively longer in adult birds, being very seldom as little as 3·9 (= 100 mm.) and generally well over 4 (= 102 mm.) In shape also it differs greatly, the upper outline running almost straight from the tip to the base at forehead, where it is, comparatively, not nearly so deep as in *bewicki*. In colouration the yellow on the base of the bill in the "Whooper" extends right down to the upper corner of the nostril and often beyond this; the outline between the yellow and

black is generally very ragged, the colours running into one another, though not fusing into an intermediate tint.

The serrations in the upper mandible in the closed bill are not visible when looked at from the side.

Adult Male and Female.—Pure white, rarely showing a slight rufous-grey wash on the feathers of the head ; this is probably due to immaturity.

Young.—Wholly a light brownish-grey.

Nestling.—White down.

Measurements. **Adult Male.**—Length 60 inches, expanse 95, wing 25·75, tail 7·5, bill along culmen (including bare space on forehead) 4·5, from tip to eye 5·16, tarsus 4·16. Weight 19 lbs. (*Hume*). Total length about 5 feet, wing 25·5 inches, tail 8·5, culmen 4·2, tarsus 4·2. (*Salvadori*).

Female.—Length 52 inches, expanse 85, wing 23·5, tail 7·5, bill as above 4·5, to eye 4·84, tarsus 4. Weight 16·5 lbs. (*Hume*).

A young bird killed in March (in India ?) measured 44 inches in length and weighed 8·25 lbs. (*Hume*).

The young have the bill a dull flesh-colour, with the tip and margins black, which extends with advancing age until it leaves only an orange band across the nostrils, and the bases of both mandibles very pale yellowish-green or greenish-white. In the adult bird the bill has the terminal half black, the base and margins of the maxilla yellow.

Legs, toes and webs black ; irides deep hazel.

Distribution.—The whole of northern Europe and Africa, extending to Japan and Greenland. Burturlin gives its most northern breeding-place as Verkhore-Kolymsk, $65^{\circ} 4\frac{1}{2}$ N. ; south, it extends in winter to southern Europe, Asia Minor, Persia, India and China.

Occurrences in India.—(1) Head and feet now in the British Museum, obtained in Nepal by Hodgson, 1829. (2) Head and feet in the Bombay Natural History Society's Museum, shot by General Osborn on the Beas river, Punjab, 6th January, 1900. (3) A skin in the same museum presented by Mr. J. Crerar, and shot by him in Larkhana district, Sind, on the 31st January, 1904. (4 & 5) Two heads in the Bombay Museum presented by Colonel Magrath and shot by Mr. M. Donlea out of a herd of seven, on the 10th December, 1910, near Dera Momin, on the Kabul river.

In reference to General Osborn's specimen he writes :—

“ While duck-shooting with a friend on the River Beas on the 6th January last, at a point just opposite Tulwara in the Hushiapur district, we saw four wild Swans on the opposite side of the river. As there was no means of crossing, and the Swans were too far and

too wary to be reached even by my four-bore duck-gun, we sent back to camp for our '303 rifles, and with these weapons we managed to secure one of the four. When we recovered the bird we found it to be undoubtedly a 'Whooper' (*Cygnus musicus*), and its weight and measurements were as follows: Weight 21 lbs., length from tip of bill to end of tail 4 feet 8½ inches, spread of wing 7 feet 5 inches.

"The bird was only winged and swam about in the river for a considerable time before I could get a man to secure it, and as long as its companions remained in sight it continued to utter its long, loud, musical trumpet-call."

Nidification.—In Iceland this was the only species of swan observed by Messrs. H. J. and C. E. Pearson, and in the 'Ibis' (1895, p. 243) they have the following note:—

"Eggs were taken on June 20th and 28th, but the weather among the hills had been so bad this spring that several pairs were only commencing to prepare their nests about the latter date. We afterwards saw a clutch of seven eggs, which had been recently taken. Although these birds sometimes breed on islands in the inhabited districts, it is little use to look for their eggs before you pass the 'last farm,' as they are generally taken either to eat or sell."

They also breed, but not, I believe, in great numbers, in South Greenland and in the north of Europe, and in Asia as far south as they are allowed by humanity—which is, of course, equivalent to slaughter.

All swans seem to have the same breeding-habits. They make huge nests of rushes, grass, and any other vegetable material which is soft enough and easily moved; the preference naturally being given to such as is most handy. These are placed on the borders of marshes and swamps, often on islands situated in such places, sometimes actually in shallow water. More rarely they are placed by rivers, either up on the banks removed from the river itself, or in amongst the rank herbage bordering its course. When the nests are placed actually in water, the swans are said to raise them when it happens to rise and threatens to swamp them; and as tame swans do this, it is in all probability true that the wild ones do also. They lay from four to eight eggs, but in captivity often lay a larger number still. I have known a tame duck-swan lay fourteen eggs in a sitting. According to Morris, the smaller number of eggs laid are generally

those of young birds, whilst the greater number of eggs are laid by those fully adult. I should think, however, judging by analogy, that though birds of the first season may lay fewer eggs than is normal, it is, on the other hand, almost certain that very old birds lay but small clutches.

Their breeding-season naturally varies very much according to the country they breed in. In the warmer-less cold, would, perhaps, be a more correct expression—countries they commence breeding in May, but in Iceland, Greenland, etc., they are normally at least a month later, and August even may still find some of the latest birds laying.

Incubation lasts from thirty-five to forty days, thirty-seven being the most usual number of days for a swan to sit, though eggs of the same clutch may vary considerably in this respect.

Swans are very good parents, and look after their young with the greatest care, the duck-bird often carrying her young ones about on her back whenever they want a rest.

General Habits.—In the 'Asian' of the 5th March, the following curious note was published; and from the habitat of the swans mentioned, concerning which the note was written, it probably relates to *C. musicus* :—

"A Scandinavian writer, cited by the 'Zoologist,' has recently described a curious method of capturing swans much employed for centuries past in the North-west of Iceland. 'The swans, after moulting in autumn, leave the interior in order to reach the coast. The inhabitants of the coast and their dogs are prepared, and, when the birds approach, begin to make as much noise as they can by shouting, striking boards with stones, and making as much of a racket as possible. This noise has a powerful effect on the young swans, which, terrified and distracted, and not knowing which way to turn their heads, allow themselves to fall to the ground, when they are captured without any difficulty.' Fear is likewise exploited in South America for the capturing of another species of swan by the Guachos, 'who, when they perceive a flock, run towards it, keeping themselves leeward to the wind, and concealing themselves. When they get close enough to the flock they spur up their horses and rush upon the birds with loud shouts. The swans, seized with fear, are unable to take flight, and allow themselves to be seized and slaughtered upon the spot.'"

In spite of the beautiful novelty of this way of catching swans, Indian sportsmen had better keep to that dear old-fashioned weapon, the "D.B." breechloader, and leave the attempt to put salt on the ducks' tails to Guachos, who can "run towards" a flock on horseback by "keeping leeward to the wind" and then "spurring up their horses," or to Icelanders, who are sufficiently distracting in their ways to confuse even the wily swan.

The Whooper has not nearly as stately or as graceful a carriage as the Common Swan, holding its neck in a much stiffer and more erect position than does that bird, which, of course, gives it a more jerky carriage when swimming. This trait may prove of use to the future sportsman or ornithologist, who sees swans at too great a distance to examine their bills, and thus ascertain to which particular species they belong.

(4) CYGNUS BEWICKI.

BEWICK'S SWAN.

Cygnus bewicki, *Yarrell*, *Trans. L. S.* xvi, p. 453 (1830) (Yarmouth, England); *Hume*, *S. F.* vii, pp. 107 and 464 (1878); *Hume & Marsh. Game-B.* iii, p. 51 (part), plate (1880); *Salvadori*, *Cat. B. M.* xxvii, p. 291 (1895); *Stuart Baker*, *J. B. N. H. S.* xi, p. 14 (1897); *Blanford*, *ibid.* p. 306; *Sharpe*, *Hand-L.* 1, p. 207 (1899); *Oates*, *Man. Game-B.* ii, p. 36 (1899); *Buturlin*, *Ibis*, 1907, p. 651; *Stuart Baker*, *Indian Ducks*, p. 12, 1908, *id.* *J. B. N. H. S.* xviii, pp. 754-8 (1908); *id. ibid.* xxi, p. 273; *Meinertzhagen*, *ibid.* xxiv, p. 167; *Stuart Baker*, *ibid.* xxiii, p. 456 (1915).

Cygnus minor, *Keyserling & Blasius*, *Wirbelthière*, pp. 6, xxxii, and 222 (1840); *Stuart Baker*, *J. B. N. H. S.* xi, pl. 1 (1897).

Description.—Of the Swans with the yellow lores, Bewick's Swan is the smallest, seldom having a wing exceeding 21 inches; indeed, Buturlin gives the greatest measurement of any bird measured by him as 20 inches (520 mm.). The bill is strikingly shorter than that of *cygnus*, being seldom, if ever, over 3·75 inches (94·2 mm.), whilst it is, on the other hand, comparatively much deeper at the base, measuring up to 1·72 inches (43·6 mm.), the diminution in depth, from forehead to tip, is also much more abrupt, so that the upper outline presents a concave appearance. The serrations of the upper mandible in the closed bill are visible over about two-thirds of the total length of the bill. In colouration the yellow is restricted to a portion of the base above, never touching the nostril, and is nearly always well defined from the black in a clean, curved line enclosing the higher extremity of the hollow in which the nostril is placed, and thence extending back along the margin of the upper bill to the gape. The feet also are much smaller, the tarsus generally being less than 3·80 inches (96·5 mm.) whereas in *musicus* it is generally over 4·2 inches (106·7 mm.), and Buturlin gives the smallest of his series of the latter bird as 4·4 inches (115 mm.).

Distribution.—Over Northern Europe and Asia as far east as the Lena Delta, extending in some numbers as far west as Great Britain, in winter it extends south into Central Europe and South Russia as far as the Caspian, and in Asia as far south as Persia, northern

India and central West China. The records of its appearance in South-east China and Japan probably generally refer to the next bird, *minor (jankowskii)*.

Occurrences in India.—(1) Skin now in Bombay Natural History Society's Museum obtained by Mr. B. L. McCulloch of the Indian police at Jacobabad in Sind, on the 2nd December 1907. (2) A skin of a female in the same museum shot by Major P. C. Elliot-Lockhart near Mardan, on the North-west Frontier, on the 30th December, 1910.

(5) CYGNUS MINOR.

ALPHERAKY'S SWAN.

Cygnus minor, *Keyserling & Blas. Wirbelthiere*, pp. lxxxii, 222 (1840) (Selenga River, Transbaikalia).

Cygnus bewicki jankowskii, *Alphéraky, Prirodai Okhata (Nature and Sport)*, Russia, September 10, 1904 (Ussuri-land); *Jourdain, Bull. B.O.C.* xxvii, p. 55.

Cygnus jankowskii, *Buturlin, Ibis*, 1907, p. 651; *Stuart Baker, J. B. N. H. S.* xxiiii, p. 457 (1915).

Olor bewicki minor, *Oberholser, Emu*, viii, p. 5 (1908).

Description.—Buturlin (*in loc. cit.*) writes:—

"It is altogether larger than *C. bewicki*, while the yellow of the bill is somewhat more developed, but the best diagnostic character is its much broader bill. Fully adult examples of *C. bewicki* have the maximum breadth of the bill 28 to 30.5 mm., exceptionally reaching to 31 mm., but then this specimen has the bill from the eye 122 mm. long."

The breadth of the bill is a good character generally, but as a matter of fact, the type of *bewicki* in the British Museum has the bill at its broadest part no less than 32 mm. wide, and another bird obtained by Yarrell at the same time has it 31.7 mm. As will be seen, however, from Gronvold's excellent plate, the shape of the bill is different from that of *bewicki*, although the distribution of colour is the same. The upper margin of the bill in *minor* is almost as straight as it is in *Cygnus cygnus*, and does not show a concave line as in *bewicki*; the bill is also much longer in proportion to the depth and the serrations in the closed bill show for three or four of their number. The yellow also appears to be considerably darker and more orange in tint than it is in either *cygnus* or *bewicki*. In the only specimens I have seen it is also noticeable that the black runs as a narrow line round the forehead.

Alphéraky treats this Swan as a subspecies of Bewick's Swan, but I see no reason why we should not give it full rank as a species. Buturlin obtained a large series and in the Lena Delta the two birds were actually breeding in the same area, yet here they acquire not an intermediate form as we should expect, but are all individually referable to either Alphéraky's or Bewick's Swans. Nor does Buturlin say anything to show that he found individuals of the two forms pairing together.

Undoubtedly some large *bewicki* are as big as small *minor*, but even these appear to be distinctly referable in other respects to one or the other form.

Distribution.—“Breeds in the tundras of eastern Siberia from the Lena Delta eastward.” “During migration it is met with as far west as Dzungaria” (Buturlin). It extends south during winter into Central Asia, and, as above, into India and China, whence I have seen a skin collected by La Touche. Probably the majority of reported occurrences of *bewicki* in China and Japan should refer to this species. A swan seen by Major Harington near Maymyo, in the Shan States, may have been of this species.

Occurrences in India.—(1) A skin in the Bombay Natural History Society’s Museum shot by Mr. Hornsby, on the 2nd January, 1911, at Tubi, Campbellpur. The orange tint in the bill of this bird was very distinct when it was first seen by me in August, 1911.

(6) CYGNUS OLOR.

THE MUTE SWAN.

Anas olor, *Gmel. Syst. Nat.* i, pt. 2, p. 502 (1788); *Latham, Ind. Orn.* ii, p. 834 (1790).

Cygnus olor, *Vieill. Nouv. Dict. d'Hist. Nat.* ix, p. 37 (1817); *Scully*,¹ *S. F.* iv, p. 197 (1876); *Blanford, S. F.* vii, pp. 99, 100, 101 (1878); *Hume, S. F.* vii, pp. 101, 106 (1878); *id. P. A. S. B.* (1878), p. 138; *Hume & Marsh. Game-B. Ind.* iii, p. 41, pl. (1880); *Salvadori, Cut. B. M.* xxvii, p. 35 (1895); *Stuart Baker, J. B. N. H. S.* xi, p. 16, plate (1897); *Sharpe, Hand-L.* i, p. 209 (1899); *Cumming, J. B. N. H. S.* xvi, p. 697; *Oates, Man. Game-B.* ii, p. 26 (1899); *Steenhoff, J. B. N. H. S.* xx, p. 1155 (1911) (Mekran); *Radcliffe, ibid.* xxiv, p. 167 (1915); *Stuart Baker, ibid.* xxiii, p. 458 (1915) (Beluchistan); *Magrath, ibid.* p. 601 (1916) (Kohat).

Cygnus unwini, *Hume, Ibis*, 1871, p. 413; *Blanford, S. F.* vii, p. 100 (1878); *Hume, S. F.* vii, p. 104 (1878).

Cygnus sibilus, *Hume, S. F.* vii, p. 105 (1878).

Cygnus altumi, *Homeyer, Hume, S. F.* vii, p. 105 (1878).

Cygnus sp. *Blanford, S. F.* vii, p. 100 (1878); *Hume, ibid.* vii, p. 104 (1878).

Description. Adult Male.—The whole plumage white, with the exception of the lores, which are black. Bill, the tubercle, base of maxilla, nostrils, margins, and nails black, remainder of maxilla reddish-horny, mandible wholly black, legs and feet dull black, irides rich brown.

Measurements.—Total length from 4 feet 7 inches to 5 feet 2 inches, wing 23 to 27 inches, tail about 10, culmen 4·2, tarsus about 4·5, but varying very much.

Weight about 15 to 20 lbs., in a wild state rarely running up to 24 or 25 lbs., in a tame state birds of 30 lbs. may be met with, and heavier birds even than this have been recorded.

Female.—Smaller than the male, and with the tubercle at the base of the bill less developed. The neck is also more developed and the bird “swims deeper in the water” (*Hume*). In the majority of the birds of this order the duck swims deeper than the drake, the reason of this being the different anatomical structure of the sexes.

¹ “I am not certain that I have identified the species. No specimen was preserved.”—J. S.

Measurements.—Length 4 feet 2 inches to 4 feet 8 inches, wing 18 to 22 inches, tail under 10, culmen about 4, tarsus about 4'3.

Young.—“Plumage almost a sooty-grey, neck and under surface of the body lighter in colour, beak lead-colour, nostrils and the basal marginal line black.” (*Salvadori.*)

Cygnet.—“Covered with soft brownish or dull ashy-grey down, which on the lower throat and breast becomes much paler, almost white, bill and legs lead-grey.” (*Salvadori.*)

In India the specimens of the Mute Swan obtained are nearly all young ones, and these have the tubercle on the bill very slightly or not at all developed, but the feathers of the forehead at the base of the bill are prolonged to a point “slightly truncated.” (*Hume.*)

When adult this swan can always be distinguished at a glance by the knob at the base of the bill, but at all ages it can be determined by the black lores.

Distribution.—The range of this bird does not seem to be nearly as extensive as that of the Whooper and *Cygnus bewickii*, that is to say in a truly feral state. As a domestic bird it is, of course, almost cosmopolitan. In the summer, in its wild state, it is said to be found throughout the central and south-eastern parts of Europe; but it is more rare in the north, and is practically absent from the extreme north and the west. It has only twice been recorded from Heligoland, once in 1881, and once many years previous to that, both times in the winter. It extends throughout Prussia and Russia. Writing of Eastern Prussia, Hartert says: “*C. olor* breeds in small numbers in some of the greater lakes.” Breeding-places are recorded in West Turkestan and Siberia, and also in Denmark, Norway and Sweden, and I believe in Greece and parts of the valley of the Danube. In Asia it is found in West Siberia and adjoining countries. In winter it extends its range to Northern Africa, but does not seem to work far to the west, through Egypt, Arabia, Asia Minor, and frequently into Afghanistan. North-west India is, however, the extreme south-east point to which it has penetrated, not being on record as yet as having been obtained in China and further east.

Occurrences in India.—(1) Skin in British Museum, shot by W. Mahomed Umar, January, 1857, in the Shah Alum River, Punjab.

(2) Two young birds shot by Captain Unwin on the Jubee Stream, North-west Provinces, January, 1871. Skins in the British Museum.

(3) Three birds, the skin of one of which is in the British Museum, shot by Mr. E. H. Watson in the Sewan district of Sind, on the 12th February, 1878. The same year many more were seen, and in five cases a pair was shot, but no skins preserved. In June of the same year, out of a herd of these birds, one was shot by Major Waterfield and one by Mr. D. B. Sinclair, and on the 7th July the latter gentleman saw another Swan in the Julabad Jheel, near Peshawar.

(4) In 1900 Mr. Jones of the Indo-European Telegraph Company shot two Swans out of a herd of nine on January 10th.

(5) In the Karachi Museum there is the skin of a bird which was captured by Mr. Cumming, plate-layer, after it had injured itself against a telegraph-wire. This was on the 13th January, 1900, and the bird formed one of a herd of eight.

(6) Two Swans were captured in nets by natives on the 6th February, 1900, at Sita Road Station.

(7) At Boston on the Beluchistan Frontier four Swans were shot by Mr. Matthews, plate-layer, early in February, 1900.

(8) In the same year Mr. J. Crerar, I.C.S., shot one about the middle of March on the Manchur Lake, Sind.

(9) At the end of March the same year ten Swans were seen and repeatedly fired at by Mr. Vivien on the Laki Lake.

(10) On the 27th April, 1900, a Swan was shot by Mr. Wragge, plate-layer, at Metong, about 12 miles from the Indus.

(11) In the same year Major-General Egerton saw a herd of Swans at Kandian on the Indus.

(12) In the end of March, 1910, Captain H. O'Brien obtained one at Nowshera.

(13) Mr. P. Lord shot one on the River Sohan, Punjab, on the 26th January, 1911.

(14) In 1911, on 6th February, Mr. L. C. Glascock shot one near Lahore.

Nidification.—This Swan is said to breed gregariously, so it is to be presumed that it is not so pugnacious a bird in its feral as in its domestic state. Certain birds which belonged to Shakespeare's birth-place used to breed every year on the River Avon; but these showed the keenest jealousy of one another, and no approach of any strange

Swan was allowed within 200 yards of the nest by the owners thereof. It must be added that their ire was roused as much by the advent of humanity as by that of their own kind. Boats were always greeted by the most warlike demonstrations and canoes not unfrequently upset, their occupants being more or less damaged by the furious birds, which made for them in the water, attempting to beat them under with their wings. These Swans, like most others of the species, generally chose small islands well covered with bushes and rushes as sites for their nests—most often selecting a mass of rushes close to the river's edge in which to place them. Now and then, but not often, one might be found well inland amongst the bushes. The site taken up by the birds was not always above flood-level, and whenever the river rose they were forced to add largely both to the height and bulk of the nest, in order that the water should not wash away the eggs. They appeared to have no difficulty in working the materials under their eggs, nor have I ever heard of their upsetting them when so employed. Occasionally, however, when much frightened, or when rushing to repel an enemy, they sweep an egg or two into the water. They sometimes make use of an immense amount of material in constructing their nests, and one such—in the Avon above-mentioned—must have contained a couple of cart-loads of weeds. What it was like originally I do not know, but when I first saw it, after a small flood, the diameter of the base must have been ten or twelve feet, and it was close on six feet high.

Subfamily PLECTROPTERINÆ.

Key to Genera.

A. A large fleshy comb at the base of the culmen in the male 1. *Sarcidiornis*.

B. No comb at the base of the culmen.

a'. Bill in length at least equal to double the breadth at base.

a''. Outline of loreal feathering at the base of the bill with the convexity anteriorly 2. *Asarcornis*.

b''. Outline of loreal feathering straight and inclined backwards 3. *Rhodonessa*.

b'. Bill not so long as double the breadth at base; head not crested 4. *Nettopus*.

a'''. Head crested. 5. *AEx*.

Another key is as follows, and this may prove simpler to sportsmen:—

A. Wing over 10 inches.

a'. Head principally black and white.

a''. Comb at base of bill 1. *Sarcidiornis* ♂.

b''. No comb at base of bill.

a'''. Upper back black; lower plumage nearly white *Sarcidiornis* ♀.

b'''. Upper back olive-brown; lower plumage chestnut-brown 2. *Asarcornis*.

b'. Head pink; bright in ♂, dull in ♀ 3. *Rhodonessa*.

B. Wing under 9 inches.

c'. Primaries not edged with silver-grey. 4. *Nettopus*.

d'. Primaries edged with silver-grey 5. *AEx*.

As already enumerated, the distinguishing features of this subfamily are: Rather long hind-toe, not lobed; a neck shorter than the

body; and especially in the male, more or less glossy upper plumage combined with comparatively long tail-feathers.

In India five genera are represented, although each by a single species only. Indeed two of the five genera possess but one species, and are peculiar to India and adjacent countries, these two being *Asarcornis* and *Rhodonessa*.

Genus SARCIDIORNIS.

This genus is separated from the other Indian genera by the presence of a spur on the shoulders of the wing. This feature was formerly considered of sufficient importance to constitute as a subfamily by themselves such birds as possessed it, and the *Plectropoterinæ*, are designated by Jerdon "Spurred Geese." Later systematists have added others to this subfamily, which now contains eight genera, many of which are not spurred.

(7) SARCIDIORNIS MELANOTA.

THE NUKHTA OR COMB-DUCK.

Anser melanotus, *Penn. Ind. Zool.* p. 12, pl. 12 (1769).

Sarkidiornis melanotus, *Jerdon, B. of I.* iii, p. 785; *Hume, Nests and Eggs*, p. 636; *Butler & Hume, S. F.* iv, p. 27; *Hume & Davis, ibid. v*, p. 486; *Hume, ibid. vii*, p. 507.

Sarcidiornis melanotus, *Hume, S. F.* vii, p. 491; *id. ibid. viii*, p. 114; *id. Cat. No. 950*; *Hume & Marsh. Game-B.* iii, p. 92; *Parker, S. F. ix*, p. 486; *Legge, B. of C.* p. 1063; *Oates, S. F. x*, p. 245; *Hume, Nests & Eggs* (Oates' Edit.), iii, p. 282; *Barnes, B. of Bom.* p. 396; *Young, J. B. N. H. S. xi*, p. 572; *Sewell, ibid.* p. 547; *Aitken, ibid. p. 552*; *Oates, Game-B. ii*, p. 102; *Blanford, Avifauna B. I.* iv, p. 423.

Sarcidiornis melanonota, *Oates, B. of B. B. ii*, p. 275; *Salvadori, Cat. B. M.*, xxvii, p. 54; *Stuart Baker, J. B. N. H. S. xi*, p. 172 (1897); *id. Indian Ducks*, p. 23 (1908); *Hopwood, J. B. N. H. S. xviii*, p. 433 (1908) (Chindwin); *Harington, ibid. xix*, p. 312 (1909); *id. ibid. p. 366*; *King, ibid. xxi*, p. 103 (1911); *Whitehead, ibid.* p. 168; *Webb, ibid.* p. 685 (1912); *Harington, ibid.* p. 1088; *Hopwood, ibid. p. 1220*; *Higgins, ibid. xxii*, p. 399 (1913); *Osmaston, ibid.* p. 548; *Stevens, ibid. p. 733* (1915); *Gibson, ibid. xxv*, p. 747; *Dhar, ibid. xxvi*, p. 842 (1919).



THE NUKHTA or COMB-DUCK.
Sarcidornis melanotos.

$\frac{1}{4}$ nat. size.

female above, male below.

Description. Adult Male.—Head and neck white, spotted with metallic black feathers, coalescing more or less upon the crown, nape, and hind-neck; lower neck and whole lower plumage white, tinged sometimes with rufous-grey; rest of upper plumage and wings black, glossed with green and blue, except on the secondaries, which are glossed with brown, and the scapularies, on which the gloss is purple; tail brown; sides of the body tinged with grey; a black mark (almost a demi-collar) on the sides of the neck, and another black band in front of the under tail-coverts descending from the rump. Lower back grey.

Female.—Like the male, but smaller and duller; head and neck more spotted with black, but the black less glossy in character, and the gloss on the upper parts also much less developed. Lower back, rump, and upper tail-coverts all grey.

Young.—Like the female, but still more spotted about the head with a dull blackish-brown; the black of the back and wings also is replaced by brown and they are without gloss.

Nestling.—“Upper parts greyish-brown; under parts greyish-white; upper part of the head brown; a whitish frontal band runs on each side of the head over the eyes: a white crescentic band bounds behind the brown colour of the upper part of the head; a narrow brown band starts from the ear-coverts and reaches a brown band on the hind neck; two white patches on the side of the back, at the base of the wings, and two others on the sides of the rump; posterior edge of the wing whitish.” (*Salvadori*.)

“The young are dull earthy brown above and dirty white below.” (*Hume*.)

Colours of soft parts.—Iris dark-brown, that of the young is said to be even darker; bill and comb black, legs and feet plumbeous.

The female and young have no comb.

Measurements. Male.—Length 28·5 (*Hume*) to 34 inches (*Jerdon*); wing 13·37 (*Hume*) to 16 (*Jerdon*); tail 5·25 to 6; bill from gape 2·5 to 2·75, at front 2·5 (*Jerdon*); comb 2 to 2·5 in the breeding season only; tarsus 2·62 (*Hume*) to 3 (*Salvadori*.)

Female.—Length about 25 to 27 inches, wing 11 to 11·5 (*Salvadori*), 12 to 14 (*Jerdon*.)

Distribution.—The Nukhta is found throughout the Indian Continent, though absent here and there where the country is unsuitable, but is certainly more abundant towards the west than in the east.

Hume says:—

“I do not know of its occurrence in the Punjab, Trans-Sutlej, or in Scind, except as a mere straggler to the eastern-most portions, I have no record of its appearance in Sylhet, Cachar, Tipperah, Chittagong, or Arakan.”

Again, in another place, he adds, when enumerating the places where it is to be found, "excluding perhaps the Sunderbuns, Jessoré, and one or two other of the deltaic districts." Of these places, several have now to be erased from the list of localities not inhabited by this bird. In the Punjab, as far as I can ascertain, it is undoubtedly a rare visitor; still it is found there, and is not so rare as Hume deemed it to be. Of its occurrence in the Trans-Sutlej, the following notes occur in 'Stray Feathers' (vol. x, No. 5, p. 430):—

"Although it (the Comb-Duck) certainly is nowhere common in this region, I know of its having been shot on more than one occasion in the Lahore District, and, again, further south in the Baree Doab, but only in the rainy season, and always in the immediate vicinity of the canals.

"I heard of a nest being taken as far south as the Changa Manga Plantation, but I am not sure of the fact. I have never heard or seen the bird West of Baree, but throughout the canal-irrigated portion of the Baree Doab, the whole tract between the Beas and the Sutlej, and the Baree, it certainly does occur, though very sparingly, during the rainy season."

After this note, which is by G. Trevor, Hume goes on to quote the 'Asian' on the subject to the following effect:—

"I am happy to state that it not only occurs, but that it breeds in the Punjab, Trans-Sutlej. A friend of mine, an engineer on the Baree Doab Canal, sent me a female *Sarcidiornis* for identification from Bhambé, in the Lahore District. On opening the bird I found a perfectly formed egg ready to be laid, and from other investigation it seemed clear that there was a nest in the vicinity. During the rains the neighbourhood of Bhambé in one direction is fairly under water, and Canna brakes are very common, with patches of water between, and dotted here and there with large trees, just the place for the Nukhta. It was at one such place that my friend saw the pair often, and on the day he shot the female, had fired one or two shots unsuccessfully at her or the male; but was rather surprised at the way in which both returned, wheeling round and round without going away any distance. As soon as the female was shot, the male went further off, and did not afford another shot; but the whole circumstances go far to prove that there must have been a nest at hand."

It has also been recorded from Sind by Webb, McCulloch and Gibson, the two former obtaining specimens, as also did another gentleman shooting with Mr. Webb.

In Cachar it is very rare, but I have seen it there, and in Sylhet, and again have had notice of its occurrence sent me from the North Looshai Hills. As regards the Sunderbands, Jessore was the district in which I first made the acquaintance of this species—a distant acquaintance only, it is true; but in the next district (Khoolna) we came into closer contact with one another. Here a pair of Nukhtas formed a part of a bag of 140 couple of Duck and Teal got by my father, Mr. T. Wilcox, and myself, in the Moolna bhil, a vast extent of swamp and water, covering fully twenty square miles of the country. This was in the cold weather, the end of January, 1883. In Cachar, Sylhet, and Looshai, the birds remain all the year round and breed, as they do in most other parts of their habitat; but in the Sunderbands I should think they are very probably migrants, though I have no evidence on this point.

In Burma, Oates reports them as common in Pegu, Hopwood records them as common in Aracan, and Harington also met with them in several districts. It is almost certain that they have been, or will be, recorded throughout that province, extending through the Indo-Burmese countries.

Out of India their habitat may be described roughly as Africa south of the Sahara, and they are also found in Madagascar, though they do not seem particularly common there. Hume says that they do not ascend the hills, but in North Cachar and in Looshai they are, at all events, found up to about 2,000 feet, if not considerably higher. Mr. C. G. Scott, an engineer on the Assam-Bengal railway, told me that once late in April one of these birds flew quite close to him as he was walking down one of the cuttings at an elevation close on 2,000 feet, and the bird, a drake, was then flying steadily up the valley. I have seen Nukhtas myself, a pair of them, in the Mahor Valley at heights ranging between 1,500 and 2,000 feet, and I once heard their hoarse cry in the Jiri Valley at least as high as the latter elevation. I know for a certainty that they breed up to at least 2,000 feet, and I am almost sure that a pair had their nest in the Mahor Valley even higher up than this. I was out after Sambhur at the time they were first seen, and in the centre of some heavy tree-forest I came across a collection of small grassy swamps, varying from some one to two hundred yards in diameter. All round

these were very lofty trees, and wherever there was sufficient dry land, others were dotted about between the pools.

On my approaching the open, two Nukhtas flew from one of the trees, uttering their loud calls repeatedly. Instead, however, of flying straight away, they continued to fly round in great excitement, and refused to leave the place, even after I had fired at and missed a deer.

Nidification.—The Comb-Duck is one of those which almost invariably resort to trees for nesting purposes, as a rule making a rough nest of grass and a few sticks in some large natural hollow of a big tree, generally at no great height from the ground. Sometimes, however, they build their nests in the forks of the larger limbs, especially when three or four such branch out together from the trunk itself. Occasionally, they seem, like the whistling-teal and the mallard, to make use of other birds' nests, for Mr. A. Anderson found some eggs in the nest of a *Haliaëtus leucoryphus* which he believes to have been laid by a Nukhta. Captain G. T. L. Marshall also found an egg of *Sarcidiornis* in the nest of *Dissura episcopa*.

The only nest I have taken myself in North Cachar was placed in a large tree standing by the edge of a small swamp, the latter completely covered with dense ekra and grass, except for a few feet all round the edge, and, even there, short weeds and water-plants almost hid the water from sight. The nest, which was rather a large one, of sticks roughly lined with grass, was placed in a hollow between where the first large boughs sprang from the bole of the tree. It was not ten feet from the ground, but the boughs were so massive, and so well enclosed the nest that I visited the pool, stood under the trees, and saw the parent bird several times before I noticed where it was. It contained three large eggs, just like those described by Hume, with a beautiful texture, reminding one, when touched with the finger, of the eggs of the barbets and frogmouths, possessing the same satiny feeling which is so uncommon outside the families mentioned. In colour the eggs are nearly white, and have a fine gloss when freshly laid, but they soil very quickly, and are then difficult to clean again.

A most interesting exception to the general nesting-habits of this bird is given by E. H. Aitken in the 'Bombay Journal' (in *loc. cit.*); he writes:—

"On the 30th August eighteen years ago I was wandering about with my gun on the banks of a small brackish stream, near Kharaghora, when a female Comb-Duck got up and went off. I fired and missed her. She flew on for some distance, and then turned and came straight for me, and I killed her. She was handed over to the cook in the course of the day, who came to say that he had found an egg in her. It was ready to be laid, and there was no appearance of any more in her, so I came to the conclusion that the bird had made its nest, and laid all the eggs but one, when it had the misfortune to fall in my way. Next day, I took two men with me, and began to make a systematic search for its nest. There were scarcely any trees in the neighbourhood, but many patches of rank rushes, and among them I hunted long without success. At last one of my men, who was on the other side of the stream, signalled to me and pointed to a hole in the bank, which at that part was quite perpendicular. I crossed, and, looking into the hole, found sixteen eggs which exactly matched the one taken from the body of the bird. They were lying on a bed of twigs and quill feathers of some large bird, with a little lining of down and some fragments of snake skin. The hole was about five feet from the ground, and about two feet deep, the entrance being about nine inches wide by about six deep. The hole went into the bank quite horizontally, and there was nothing in the way of a ledge to alight on at the entrance, so that the bird must have popped in as a pigeon does. Such a feat fully justifies the opinion, that the Comb-Duck is not a clumsy bird."

The number of eggs laid seems to vary very much, but probably a dozen or less is about the normal number, though Anderson seems to have had from fifteen to twenty brought to him not infrequently, and on one occasion found the enormous number of forty eggs, of which thirty-nine were normal and one undersized. He captured a female on this nest, and says that she was in an emaciated condition, and therefore, he believed, authoress of the whole forty eggs.

Even this huge "clutch" of eggs has recently been beaten by one found by Mr. T. R. Livesey, who obtained a nest with forty-seven eggs in a large hole in a hollow tree about twenty-five feet from the ground. This was at Kotah, Rajputana, and Mr. Livesey thinks the eggs must have been the product of two or more ducks. A dozen of the eggs were quite fresh, whereas all the rest appeared to have been incubated some ten to thirteen days.

Probably a wild bird, with no extraneous aid in the way of artificial food, &c., would be a great deal exhausted after such an effort, but a domestic hen would not think it anything out of the way, nor would she be any the worse for it.

Hume's forty-five eggs varied from 2·22 to 2·58 inches in length, and in breadth between 1·65 and 1·78, averaging 2·41 \times 1·72. The little clutch found by Mr. Anderson, excluding the abnormally small one, averaged 2 $\frac{1}{2}$ \times 1 $\frac{3}{4}$ inches, giving an average for the whole 84 of 2·45 \times 1·74 almost.

Jerdon says that the Nukhtas breed in July or August "in grass by the side of tanks, laying six to eight whitish eggs." Jerdon did not, however, know, nor did he care, much about the oological part of ornithology; and I do not think much weight need be attached, as a rule, to what he says about nidification.

The breeding-time, nearly all over India, varies from the end of June to the beginning of September, and probably much depends on when the rains commence. In Assam, where the rains, like the poor, are always with us, I think the birds begin to breed in the end, or even in the beginning of June. In Bengal they commence to breed in early July; in the North-west in late July or August, sometimes as late as September. In Burma they seem to breed in the two first-mentioned months, and in Ceylon alone they alter their habits and are said to breed in February and March. This last statement, however, is not very well authenticated, and may be a mistake, for Legge says: "In Ceylon this Goose breeds, *I understand*—(the italics are mine)—in February and March."

General Habits.—The sort of ground they prefer has been variously described by different writers. In Assam they keep much to water in thin forests, and more especially to such water as is well covered with weeds and grasses, and not of the clearest and cleanest. One or two birds were always to be met with near Diyangmukh, on a nullah which runs through alternately heavy forests and open grass land, but in the cold weather is reduced to shallow pools.

Hume says:—

"It much prefers well-wooded tracts, not dense forests like the White-winged Wood-Duck, but well-wooded level, well-cultivated country. It is a lake bird too, one that chiefly affects rush and

reed-margined broads, not bare-edged pieces of water like the Sambhur Lake, and is comparatively rarely met with on our large rivers. I have shot them alike on the Ganges and the Jumna in the cold season, but it is far more common to find them in jhils and bhils. *I have never found it in hilly ground, and very rarely in small ponds.*" (The italics are mine.) "Just when the rain sets in they seem to be on the wing at all hours of the day, and almost wherever you go in the North-west Provinces you see them moving about, always in pairs, the male as a rule in front. They never, as far as I have observed, associate in flocks. There may be half-a-dozen pairs about a broad in the rains, or half-a-dozen families, each consisting of two old and four to ten young birds, during the early part of the cold season; but I have never seen them congregate in flocks as most geese and so many of the ducks do."

Oates (*vide 'Birds of British Burma'*) seems to have found them in much the same kind of places, and also in paddy-fields; but he says that in Burma they are found "singly, in pairs, or in small flocks of twenty or thirty individuals." Jerdon, on the other hand, says that, although they are generally found only in small parties of four to ten individuals, yet they are sometimes found in flocks numbering over 100. This I should imagine is most unusual, and we may take it for granted that, *as a rule*, they go in pairs only, except when they have a family, and that occasionally two or more families join forces; and again, when the breeding-season is over, the young are often to be found singly, the old birds alone continuing to keep in pairs. Mr. Young found them in flocks in both the N.W.P. and in the Panch Mahals, but adds, "they seem to keep their pairs even in the flock, for when one has been shot, and the flock has flown away, I have observed one remain behind and flying round, searching for its mate."

The general consensus of opinion appears to be that they are not very wary birds, and in consequence are not hard to bring to bag. Of course, as Hume says, you cannot walk up to them and pot them as they swim about unconcernedly on the water; but with comparatively little trouble and care one ought always to succeed in getting near enough for a shot, unless the country surrounding them is utterly bare and destitute of cover for the sportsman. Once disturbed, their flight, etc., is variously described. Hume says: "Their flight is powerful and fairly rapid, and they are all round quicker, more active birds than geese, both on the wing and in the

water." Jerdon, however, did not think much of the bird as a "progressionist," and Legge describes their flight as heavy, and leads one generally to the belief that he deemed the species rather an awkward, clumsy bird—which it certainly is not. Tickell's remarks in general on this bird vary so much from those recorded by other people that they must be quoted nearly in full:—

"I have met with these birds chiefly about West Burdwan, Bankoora, Singbboom, and Chota Nagpur, in open, uncultivated, bushy country, or on a gravelly soil scattered over with small, clear ponds or tanks, where they may be found in parties of four or five, resting during the heat of the day on the clean pebbly or sandy margins, and flying off, if disturbed, to the next piece of water. Wherever found, they appear to prefer clear water, with a gravelly or stony bottom, and are never found in shallow, muddy jhils or marshes, which attract such hosts of other kinds of wildfowl. They are wary, and as they take to wing generally at a long-shot distance, and have both skin and plumage exceedingly thick, it is difficult to kill them with an ordinary fowling-piece; and if winged on the water, they dive so incessantly as to require the help of several people to catch them.

"I have placed their eggs under domestic hens and ducks, and hatched and reared the young birds easily, but they never became thoroughly tame, and escaped on the first opportunity, though they had, up to the time of their flight, fed readily with the poultry in the yard. They ran and walked freely, and could perch on anything that did not require to be grasped. It is an exceedingly silent bird—indeed, I have never heard it utter any sound. They repose chiefly on gravel beaches by the side of clear water. Their flight is high and well sustained. At night they roam over the paddy stubble, and I have found their stomachs full of rice during the harvest."

Other people seem to have been more successful than Tickell in domesticating this fine duck (or goose), and there are numerous instances on record in which the bird has been readily and thoroughly tamed. How a cross between this and any of the breeds of domestic duck would answer is very problematical. Of course, the product would be a bird of size and weight, but how about the flavour? The Nukhta is not a bird that finds favour with most people as an article of food, though it makes very good soup and not bad curry; and the ducklings, when killed just after they have taken to the wing, are quite delicate and good.

Though Hume never found any grain except wild rice in the

stomachs of the birds he examined, others, besides Tickell, have found that cultivated rice forms one of the articles of their diet. They eat all sorts of shoots, roots, seeds, etc., of water-plants, varying this vegetarian food with a little animal stuff now and then, such as worms, spawn, larvæ, and perhaps an occasional fish.

The voice of the Nukhta is, according to Legge, "a low, guttural, quack-like sound, between the voice of a duck and a goose." The few I have heard uttered loud cries, which seemed to me far more like the notes of a goose than of a duck. A pair, whose nest I afterwards found, used to herald my approach to their particular piece of water with loud trumpet-calls, uttered by them, when they first saw me, from their perches high up in the tree. They roost, I believe, always in trees, and not in the water or on the ground, and they are not nocturnal, or even crepuscular, birds in their habits, as are most of their order.

The African form alluded to by Hume as *S. africanus* is not specifically distinct from our Indian *S. melanota*, though it averages a little smaller—the wing being about thirteen or fourteen inches in the male.

Hume also refers to Sclater's plate of *Sarcidiornis*, and, referring to the under tail-coverts therein depicted, says that in all the Indian specimens he has seen the tail-coverts are always white. As a matter of fact, although the under tail-coverts in the plate should have been white and not yellow, the bird shown in the plate is not our Nukhta at all, but *S. carunculata*, a much smaller species, found in Brazil, Paraguay, and North Argentina.

This and other ducks belonging to this subfamily are amongst those requiring a close-time, as all of them are residents or mere local migrants. This close-time might extend from the 1st June to the 1st December. Tickell says that by October most of the young are on the wing, but in some parts of India this is at least a month too early; and I do not think that the 1st December is too late a date for commencing their slaughter.

Genus ASARCORNIS.

This genus is one specially created by Salvadori for the White-winged Wood-Duck, which previously had been placed either with *Sarcidiornis*, *Casarca*, *Anas*, or *Tadorna*. It seems to be allied most nearly to the first-mentioned of these genera, differing in possessing no comb or spur, and in having a flatter and larger bill. There is no other member of the genus.

Hume, in a foot-note to 'Game-Birds,' p. 147, gives his reason for rejecting the name *A. scutulata*, which is, that Blyth considered Müller's birds to be of a different species from the wild ones found in India and Burma. Salvadori, however, who had more material to work on than was available to Hume at the time he wrote, considered that *A. scutulata* does apply to our bird, and that the domesticated or confined bird is inclined to albinism. Under the circumstances, I think it is better to follow Salvadori and accept Müller's name.



THE WHITE-WINGED WOOD DUCK.
Asacornis scutulata.
 $\frac{1}{4}$ nat. size

female

male.

(8) ASARCORNIS SCUTULATA.

THE WHITE-WINGED WOOD-DUCK.

Anas scutulata, Müller, Verh. Land en Volk. p. 159 (1839-44) (Java) ; Hume, S. F. viii, p. 158.

Casarca leucoptera, Blyth, J. A. S. B. xviii, p. 820 (1849) (Burma) ; Jerdon, B. of I. iii, p. 793 ; Hume & Davis, S. F. vi, p. 489 ; Hume, ibid. p. 170.

Casarca scutulata, Hume, S. F. viii, p. 115 ; Hume, Cat. No. 955.

Anas leucoptera, Hume & Marsh. Game-B. iii, pp. 147 & 172 ; Oates, B. of B. B. ii, p. 281 ; Hume, Nests and Eggs (Oates' ed.), iii, p. 287.

Asarcornis scutulata, Salvadori, Cat. B. M. xxvii. p. 60 ; Young, J. B. N. H. S. xi. p. 572 ; Stuart Baker, J. B. N. H. S. xi, p. 181 ; id. Indian Ducks, p. 32 (1908) ; Hopwood, J. B. N. H. S. xviii, p. 433 (1908) ; Macdonald, ibid. xix, p. 263 (1909) ; Harrington, ibid. p. 218 ; Huggins, ibid. xxii, p. 632 (1912) ; Stevens, ibid. xxiii, p. 733 (1915).

Asarcornis leucoptera, Oates, Game-B. ii, p. 139 ; Hopwood, J.B.N.H.S. xxi, p. 1220 (1912).

Asarcornis scutulatus, Blanford, Avifauna B. I. iv, p. 424.

Description. Adult Male.—Head and upper part of neck white, thickly spotted with black, the black spots usually more numerous on the upper part of the head and neck ; lower part of the neck and mantle glossy black, the whole of the lower parts rich chestnut-brown, more or less mottled, when freshly moulted, with glossy black on the breast and abdomen ; back, rump, and upper tail-coverts olive-brown, glossed with metallic blue and green ; scapularies olive-brown ; smaller upper wing-coverts white, the median ones a soft blue-grey, broadly tipped with black, which is highly glossed in old males ; quills olive-brown, the secondaries with the outer webs bluish-grey, forming a speculum ; the first inner secondary or tertiary white on the outer web, and the quill next it with a large white patch on the same web ; under wing-coverts and axillaries white, the former with a few brown feathers mixed ; tail blackish, glossed with green in old males.

Colours of soft parts.—The bill varies from lemon-yellow to deep orange the base and tip black, and with black mottlings everywhere, generally least numerous about the centre of the bill. Gony's paler, as a rule, than the rest of the bill. During the breeding-season the base of the maxilla becomes considerably swollen, though never becoming an actual comb, and the orange

colour deepens to deep orange-red or light-red. The legs and feet vary like the bill from lemon-yellow to a dull orange. The joints, toes, and webs are almost invariably mottled with dull-greenish, and patches of the same colour are to be found on the tarsus itself. The toes are always dark. Irides brown and blood-red in old birds.

Weight $7\frac{1}{2}$ lbs. to $9\frac{1}{2}$ lbs. when in good condition. An old male in captivity, and very fat, weighed $9\frac{3}{4}$ lbs.; but wild birds seldom weigh more than $8\frac{1}{2}$ lbs.

In old males all the spots and the black of the upper parts are glossed with green, and the bird in life looks a brilliant metallic green when in the sun. The gloss is green at the tip of each feather with a subtip of purple. The colour of the lower parts varies very much, both in depth of colouring and in the extent of the black mottling. In birds when freshly moulted the colour is usually a rich red-ochre-brown, and the black mottlings—confined more or less to the tips of the feathers—rather extensive. In faded plumage, the lower parts are a pale dull earth-brown, with but little tinge of red, and practically no black at all.

In the same way, by about July or August, the whole of the upper plumage becomes bleached, and the gloss almost or quite disappears.

I think very old males become more white about the head and neck, more especially round the eye. A very fine male which was in my possession for some years became quite white for a space all round the eye and down the front of the neck.

Measurements.—Length 26 to 30 inches, wing 14·3 to 15·8, tail 5 to 7 (according to condition), culmen 2·3 to 2·6, tarsus 2·2 to 2·4.

The Female does not differ conspicuously from the male, and birds in their first plumage are hardly distinguishable; on the whole, it is not so highly coloured or quite so highly glossed, and perhaps has less black on the lower parts. The difference is, however, one only of comparison, and a duck in good plumage is far more highly glossed and coloured than a male whose colours have begun to fade.

Colours of soft parts.—The colours of the soft parts are similar to those of the male, but paler and duller; the bill is usually of a pale dull lemon, very rarely with an orange tinge, and never with this tinge at all strongly developed; the black mottlings resemble those on the bill of the drake, and vary to the same extent. In both sexes I have seen bills the ground-colour of which was almost obliterated by the spots, and others again in which there were only a few small spots near the tip and base.

The base of the upper mandible is never swollen or red in colour. Irides are brown, never, I *think*, red-brown, and certainly never blood-red.

Measurements.—Wing, 12 to 14 inches, tail 5 to 7, culmen 2·2 to 2·4, tarsus 2·1 to 2·24. Weight $4\frac{3}{4}$ to $6\frac{3}{4}$ lbs.

It does not seem necessary here to quote other authors in reference to coloration, size, weight, etc., as a very large number of these birds

have passed through my hands or have been kept by me in captivity, and my own notes include all the information given by others.

Distribution.—This is one of our least known ducks, and records of its distribution are still very limited. It is very common in Eastern Assam, and extends throughout Burma, being common in Aracan and less so as one proceeds southwards, though it has been met with in some numbers in Tennasserim.

As regards Jerdon's letter to Hume, in which he mentions this bird as congregating in large flocks, it is a pity we have not the date of it. In 1864, when he finished his third volume of 'Birds of India,' he evidently looked on the bird as rare in the extreme. He talks of it *occurring* in Dacca and other parts of Eastern Bengal, but does not lead one to infer that it was anything but uncommon even there. If his letter was written prior to 1864, it may be taken for granted that in the meanwhile Jerdon had discovered his mistake, whilst if written after 1864, it shows that Jerdon made a mistake, which, as far as anyone knows, has never been rectified.

He says:—"I have seen several flocks of *Casarca leucoptera* in the lower parts of the Brahmapootra, where it joins the Ganges, not far from Dacca, where, indeed, Simson has seen it."

Thirty years more added to the years when Hume and his collectors worked the country above referred to has shown that it could not possibly have been the Wood-Duck which Jerdon saw or referred to. That Simson saw it in Dacca certainly does not prove that it inhabits the Megna, Brahmapootra, and Ganges in numbers, and to my own knowledge there has been no record of a single specimen having been seen there for over twenty years. The only other notice of its occurrence that I know of in Eastern Bengal is of four birds, said to have been seen in Singbroom by Mr. W. Moylan, when out shooting with two other guns; of which four birds, one (a drake) was shot.

Colonel Graham seems to have found it common in the Lakhimpur district of Assam, where, however, it appears that he only got one bird from Sadiya, and he notes it as rare in Darrang. Godwin Austen procured one on the river Dunsiri, saw one in the Garo Hills, and knew of one killed in Tezpur. Two were seen by

myself in 1886, when partridge-shooting in the Barpeta part of the Kamroop district, and were missed by me with both barrels at long ranges. The bird is known and well described by the Cacharies, but though I once heard a pair on the borders of the Cachar and Naogang districts, I failed to get a sight of them. Outside these limits it extends to the Malay Peninsula, Sumatra and Java. It thus seems probable that it will be found to inhabit suitable localities in Eastern Bengal, where, however, it is of extreme rarity; but it becomes less rare as we enter the Assam Valley, and is found in some numbers throughout the Namba forest, south of Brahmapootra, and the foot-hills and forest to the north of the same. In Eastern Assam it becomes comparatively common, and extends through Cachar and the Indo-Burmese countries and Burma to the Malay Peninsula. Mr. E. H. Young (*in loc. cit.*) says that he once shot a duck, which he believes to have been of this species, in a tank in the Central Provinces a few miles from forest-covered hills. The record is not, of course, a certain one, and the locality is such an extremely unlikely one that the identification was probably incorrect.

Nidification.—There is nothing on record as regards this bird's breeding in a wild state and I quite failed to induce my captive birds to breed, though one duck which died—the only one I lost thus—contained eggs larger than a hen's eggs. This was in the month of June. The birds paired regularly every May, and the bases of the drakes' bills became swollen and red, but the ducks never laid any eggs during the five years they were kept.

The only egg I have of this species is one which was taken in the Cachar Hills by one of my trackers at the place where, as I record further on, an attempt was made to have a pair of these birds driven up for a shot. The nest was taken from a deep hollow, caused by decay, in the first bifurcation in the trunk of a large tree standing on the banks of the stream already described. The tree was a very small thick one, and the hollow in which the egg was found was said to be some twenty feet from the ground. The nest was described as a mass of grass and other rubbish with a lining of feathers and down, probably of the bird itself; though, as none was shown me, I cannot be certain of this.

In Sadiya, whence I obtained a great number of birds and skins,

the Mikirs assured me that the birds sometimes made their nests in holes in trees, sometimes made a rough nest on masses of branches, and at other times made a grass and feather-lined nest in scrub-jungle or grass at the edge of pieces of water lying in jungle.

The live birds were all obtained by setting innumerable nooses about the edges of the waters frequented by them, and I was told that they were easy to set, as these ducks habitually resort to the same few feet of ground when entering or leaving the water.

General Habits.—In 1900 I was stationed at Dibrugarh, the headquarters of the Lakhimpur district, and soon became well acquainted with this duck. Indeed I had only been a few days in the station when a pair flew over the tennis-courts while we were playing tennis, and during the five years I was in the district I must have kept some thirty or forty of them in a tealery and seen others kept by planters and other people in the district.

A Mr. W. T. Burness, for many years a planter in the Lakhimpur district, was singularly successful in obtaining specimens of this fine duck, although, before being told, he did not appreciate the value of the beautiful birds, and shot and ate them.

All along the foot-hills of the Himalayas there stretches a vast strip of virgin forest, devoid of all cultivation of any sort whatever, but a good deal broken up by swamps and lakes, some so tiny that the trees almost meet over their black stillness, others so wide and big that there may be miles between their opposite banks.

In such places as these, especially where pieces of water of the smaller description are numerous, the Wood-Duck may be sought almost with a certainty of success, and on lucky days Mr. Burness would return with three, four, or even five birds, having seen possibly twice as many, although the getting of them might have entailed a walk of twenty miles or more. The birds were but seldom seen by him in flocks, generally in pairs, often singly, and never more than five or six birds together. Even in the deepest, darkest woods they were most wary and difficult to approach, and took to flight at the sound of anyone coming within shot. When wounded, they *never* dived, but at once swam to the nearest shore, and scrambling into the woods concealed themselves in the dense undergrowth.

These ducks, however, are not entirely confined to such heavily forested country, but are frequently met with in smaller patches of jungle in which there are pools and swamps, and I have received numerous specimens shot in such places. They also frequent sluggish streams and back-waters, but never, as far as my experience or information goes, clear waters or swift-running streams.

Very little information has been forthcoming about their call, and very few sportsmen seem to have heard them. Colonel Graham has recorded: "They roost on trees, and frequent solitary pools in deep tree-jungle. They are always in pairs, and may be heard calling to one another at great distances." This agrees well with what I have known of them. My first experience of them was in North Cachar; when out shooting one rainy day in June I heard two birds calling to one another in loud goose-like calls. The forest was very dense and consisted almost entirely of trees with practically no undergrowth, but through it there wandered a sluggish dirty stream which here and there disappeared into small morasses, dotted with tiny pools of clear water. Thinking the safest way to get a shot would be to drive them, I sent my Cachari tracker to beat down the stream towards me from a point some 200 yards or so above where we heard them calling. The drive proved a total failure, as, though the birds flew within thirty or forty yards of me, they kept inside the forest on the same side of the stream as that on which I was seated, and I hardly caught a glimpse of them, much less obtained a shot. The Cachari told me that when he came on the first one it was in a tree, from which it did not fly until he was underneath, and that then it made off to its mate, which was some 200 yards higher up the stream. They then both settled in a small pool and did not again take wing until he had sneaked to within twenty yards, when they got up and flew straight away, passing, as I have already said, just out of sight of me. We heard them calling in the same place for two or three days after this, but when attempts were made to stalk them, they made off long before a sight was obtained of them or a shot possible.

The pair met with at Barpeta were seen when I was out shooting Kya partridge in some ekra-covered patches of swamp surrounded by forest. On this occasion a pair got up out of some swamp, some

forty or fifty yards from me, just as I emerged from the forest. Two barrels of No. 7 pattered on their backs at once, but seemed not to have the smallest effect on them. These two birds flew like geese, one bird (the male, I suppose, for he looked much the heavier) about two yards in front of the other, their necks fully outstretched and squawking loudly as they flew for the first few hundred yards. Whilst in the open they flew within a few feet of the ground, but on regaining the forest mounted higher, until they disappeared altogether in the distance.

Whilst beating for tiger in scrub and tree-jungle on the banks of the Dibru stream, at that time only a succession of muddy pools, we once put up a flock of seven of these grand birds, which flew round and round us, at a considerable distance, for a long time before they eventually cleared off. These seven—the largest number met with in a flock that I have any certain record of—flew in line as geese do, and in the distance would probably have been mistaken for such.

Mr. Moylan, in narrating to me how he met with this Duck in Sini, in Singbhook, said that at the time they were shooting in grass-covered swamps at the edge of heavy forest. They were standing thus, when they saw four birds, which he took to be geese, coming down towards him and his companions. They were at a great height, but a charge of S.K.G. took effect on the foremost, and he came crash to the ground, turning out to be a fine drake. It is possible that Mr. Moylan may have been wrong in his identification, but I failed to discover any reason to make me think so, though I questioned him closely on the matter. This was the only occasion on which he ever saw the duck.

In addition to the ringing trumpet-call of this bird, both drake and duck indulge in a very low quacking note, sounding very much as if a mallard were trying to quack under its breath. Whilst uttering this note, the head is always held low, and the bill wide open. When angry, they also make a hissing noise at one another.

They are charming birds in captivity, and are tamed without the slightest difficulty. When the breeding-season approaches, they, if not confined or pinioned, fly away; but throughout the cold weather months they may be allowed to wander about at their own discretion, and will always keep near home if regularly fed. When

thus domesticated it is a curious fact that they seem never to use their wings as a means of locomotion, but will walk very long distances to and from water. A duck belonging to a planter whose house was nearly half a mile from water invariably *walked* there and back every evening, returning to the house for the hot hours of the day and for the night. This particular Duck was the object of a wild infatuation on the part of a small domestic drake, who followed her about wherever she went, and as the Wood-Duck could walk at, at least, thrice the rate the drake could, he eventually succumbed to sheer exhaustion and want of time to feed in. She, however, totally ignored all his advances, and in April flew away to find a wild mate.

They are very impatient of heat, and the birds in my aviary always retired indoors as soon as the sun was up, and even in the cold weather they always kept under cover from 10 a.m. to 2 p.m. Those I sent down to the Calcutta Zoo died very quickly, except one fine drake, who lived about eighteen months before dying of the same disease that carried off all the rest—an affection of the stomach.

My birds were practically omnivorous, but would touch no dead animal food. Every other day a pail-full of small fishes was emptied into their tank, and by nightfall these were generally all accounted for; but any that died during this period were never eaten. In the same way, worms that ceased to struggle were discarded, and grasshoppers, frogs, and snails would only be taken if alive.

They ate paddy and husked rice freely, and I have kept birds for some weeks on this alone, and they kept fat and well upon it, but, at the same time, when they were offered animal food they preferred it to the grain. Green food of all sorts they refused unless very hungry, and I could never induce them to eat any sort of water weed, though one would expect them to eat such in a wild state.

They were extremely expert in catching fish; as a rule, they skimmed along the top of the water with the head and neck immersed, but when necessary would dive and chase the fish under water. Of course, their speed when doing so was not comparable to that of cormorants, or the diving ducks under the same circumstances, but it was sufficient to ensure the capture of almost any fish. They are very mild, well-behaved birds, and not, as a class, at all quarrelsome.

Some tiny whistling-teal shared their captivity, and were always treated with consideration and allowed their share of food, etc. As already said, they very soon become tame, and within a few weeks they were all tame enough to accept food from the hands of those they knew well ; but generally when strangers appeared they retired to their inner room. When not feeding, they almost invariably sat on the perches and not on the ground, and they showed considerable activity in turning about on them ; at the same time they kept their position almost entirely by balance and not grasp, as anything touching them at once upset them.

Their trumpet-call was very seldom heard when caged, but about April and May they were sometimes heard calling at early dawn, and even more rarely at sunset.

This duck commences its moult in September or early October, and this once commenced is extremely rapid ; the quills—both rectrices and flight-quills—come away altogether, and the bird is incapable of rising more than a foot or so from the ground for about a fortnight, by which time the wing-quills are sufficiently advanced to enable them to flutter from one perch to another, or, in exceptional cases, to take short flights. The soft feathers come after the quills, though a few new breast and back feathers may sometimes show even before the quills fall.

The contrast between the glossy new and the dull blackish old feathers is very great, and one can hardly believe that it is the same bird. The natives say that, prior to the moulting, these ducks all retire to morasses lying in absolutely impenetrable forest and cane-brake, and there remain until they are once more able to fly.

Genus RHODONESSA.

The genus *Rhodonessa*, like the preceding, consists of but one species, which is confined to Indian limits. In adult or semi-adult birds the colour of the head is sufficient to define it at a glance; should, however, the bird be in its first plumage, reference must be made to its loreal feathering, as mentioned in the key above.

(9) RHODONESSA CARYOPHYLLACEA.

THE PINK-HEADED DUCK.

Anas caryophyllacea, *Jerdon*, *B. of I.* iii, p. 800; *Hume, Nests and Eggs*, p. 644; *Fairbank, S. F.* iv, p. 264; *Davidson, ibid.* vii, p. 95; *Ball, ibid.* p. 232; *Hume, ibid.* p. 492, *id. ibid.* viii, p. 801; *Hume & Marsh. Game-B.* iii, pp. 174, 435; *Barnes, B. of Bom.* p. 404.

Rhodonessa caryophyllacea, *Ball, S. F.* ii, p. 438; *Hume, ibid.* viii, p. 115; *id. Cat. No. 960*; *Butler, S. F.* ix, p. 437; *Reid, ibid.* x p. 81; *Hume & Marsh. Game-B.* iii, p. 173, 435; *Oates, B. of B. B.* ii, p. 284; *A. Taylor, S. F.* x, p. 531; *Hume, ibid.* xi, p. 344; *Hume, Nests and Eggs* (Oates' ed.), iii, p. 200; *Stuart Baker, J. B. N. H. S.* xi, p. 185; *Salvadori, Cat. B. M.* xxvii, p. 61; *Inglis, J. B. N. H. S.* xv, p. 338; *id. ibid.* xvi, p. 75; *Stuart Baker, Indian Ducks*, p. 41 (1908); *Inglis, J. B. N. H. S.* xvi, p. 75 (1904); *Jardine, ibid.* xix, p. 264 (1909); *Higgins, ibid.* xxii, p. 399 (1913); *Whistler, ibid.* xxiv, p. 599 (1916); *Marshall, ibid.* xxv, p. 502 (1918).

Description. Adult Male.—“Head, sides, of neck, and hind-neck a beautiful pale rosy-pink, with, in the breeding-season, a small tuft of still brighter rosy on the top of the head; throat dark brown; rest of the plumage fine glossy dark chocolate-brown, paler and less glossed beneath, but under tail-coverts very dark; mantle, scapulars, breast, and sides with very fine rosy whitish vermiculations or points; edge of the wing whitish, speculum reddish-fawn or dull salmon colour, with a white band at the tip of the secondaries; outer web and tip of the outer primaries brown; the



THE PINK-HEADED DUCK.
Rhodonessa caryophyllacea.
 $\frac{1}{3}$ nat. size

female.

male

inner web and inner primaries buff; tertials glossy chocolate-brown, narrowly edged with black on the outer web; under wing-coverts and quills beneath pale pink colour, with a satin lustre; tail chocolate-brown." (*Salvadori.*)

In Jerdon and Barnes (Appendix, Jerdon), *in loc. cit.* we find the additions "edge of the wing whitish, uppermost tertaries rich glossy green."

This is right, and is shown in Hume and Marshall's plate, but the average bird has not so bright or light a green and has it even more glossy.

The depth of the brown varies a good deal, and I am inclined to think that it is owing to age, very old birds being the darkest, nearly black. Condition of plumage in this, as in every other species of brown or black bird, has a good deal to do with the colour, and brown in old plumage is always *much* duller and paler than in the fresh. I have certain spine-tail swifts which show a mixture of quite light brown feathers with new black ones glossed with blue, the former being merely old ones from which the colouring matter has become exhausted.

Colours of soft parts.—"Bill reddish-white, rosy at the base and bluish at the tip, irides fine orange-red, legs and feet blackish, with a tinge of red." (*Jerdon.*)

"Bill dirty red, cere flesh-coloured, irides deep orange-red, legs and feet reddish-slate." (*Shillingford.*)

Of another he notes:—

"Bill light-pink, assuming a purplish-tint towards gonys, cere flesh-coloured, irides deep orange, tarsus, web and nails dark slate, inclining to purple, lower mandible more deeply coloured than upper."

The following note of my own may explain Shillingford's "cere." "Bill dull reddish-pink, deeper on mandible and darker still on gonys, the base of both mandibles, more especially the maxilla near the forehead, pure and brighter pink." *This note was taken from an adult male.* Inglis describes the soft parts from a live bird in his possession:—

"Bill light pink, pinker at tip on nail, base of maxilla and whole lower mandible flesh-coloured, the colour being on some skins half an inch broad (the cere) at the base of the maxilla, edge of nostrils black, iris light-red, legs and feet reddish-black, rim round eyelids flesh-coloured."

Measurements.—"Length about 24 inches, wing 10·5, tail 4·25, culmen 2·1, tarsus 1·6." (*Salvadori.*)

Female.—"Similar to the male, but duller and paler, and more of a smoky-brown; the pink of the head is dingier and paler, and there is a broad brown medial band from forehead over crown and occiput, and (diminishing rapidly in width) on the back of the upper neck; but the most conspicuous difference is that the dull pink of the face runs on, unbroken, over the entire chin and throat, so that there is no trace of the dark band along chin and throat so conspicuous in the male." (*Salvadori.*)

The colours of the soft parts in the female seem to differ in being all of

a duller hue. There is only one sexed skin in the British Museum (which possesses only six adult skins altogether), and this a female. The only colours given, however, in the catalogue are those quoted as from Shillingford, but I do not know the authority from which these are taken, and Shillingford himself does not seem to have sexed his specimens.

Oates says that of the birds he has examined he has found the females to be about equal to the males in size. He gives the wing as 11 inches. The only other record of female measurements is in the Appendix to 'Game-Birds,' where a female is said to be 23 inches long with a wing of 10.5, and an expanse of 37 inches; strange to say, also, she weighed more than three out of the four males that are mentioned in the same place.

Young.—"Head and neck pale rose-whitish colour, with the top of the head, nape, and hind-neck brown; the whole plumage lighter brown; the underparts pale dull brown, with the edges of the feathers whitish." (*Salvadora*.)

I do not understand the young bird depicted in the plate in 'Game-Birds,' and have never heard of any like it in plumage, the "rose-whitish" colour being always a distinct feature.

Distribution.—The headquarters of this duck are, as Hume says, Bengal, north of the Ganges and west of the Brahmapootra rivers; above all, it is most common in Maldah, Purneah, Purulia, and adjoining districts, the two first-named places being especially favoured. It has also been obtained in Arrah, Mozufferpore, Chota-Nagpur, and Ranchi, where it is only a rare bird, and Singhboom, where it is rather more common. It is also found sparingly through Orrissa, and as far south as Madras, and all through Eastern Bengal and Assam up to Manipur, where Hume obtained it, and later Colonel Tytler and Mr. Higgins. Hume says in Vol. xi of 'Stray Feathers' about *Rhodonessa* :—

"This species is very scarce in Manipur. I only saw it at the Lagtak Lake, and there I only saw one party that kept up in a weedy lagoon at the north-east corner of the lake, where it was impossible to get them. I did get a single bird, but that was only by lying upon several occasions in a thick reed-bed and getting them driven. Three times they went in the wrong direction, but having at last made out their line, I laid up in the right place the fourth time and knocked down a brace, of which, however, I only recovered one; I had no dog. This species occurs in Sylhet, and has been procured in various parts of the Assam Valley right up to Sadiya, but alike in Assam and Sylhet (there seems to have been no record of its occurrence in Cachar) it appears to be excessively rare, little more than an occasional straggler."

In Burma it is extremely rare; Blyth obtained it in Arakan, and says that it occurs in Independent Burma (where?), but Oates did not come across it in Pegu, and I can find no other record of it.

Hodgson obtained it more than once in Nepal, and Pemberton in Tibet. "A member of the Society" in Vol. ii of the 'Bombay Journal' writes:—

"In Scind I have one report of the Bengali pink-headed duck occurring as a straggler, but it cannot yet be called a recorded species."

I suppose by this he means that he does not place much faith in the report.

I see Murray does not record it as a Sind bird, although he is very generous in the number of birds he assigns to that part of India.

Mr. Moylan told me that once out shooting in Sini, in Singbhook, with three other guns, they accounted for no fewer than six of these lovely ducks. They were found in the muddy, weedy, reed-covered tanks, lying just outside the heavy forest. Here they were in company with vast numbers of other kinds of ducks and teal, a big bag of which was made on this occasion. He seems frequently to have met with them in various parts of Singbhook, but, as far as I could ascertain, had not seen any others shot.

In the Punjab its occurrences are limited to seven actually recorded. Two were shot by Colonel Kinloch, and another is mentioned by him as having been shot by a friend (a brother officer), whilst another is noticed by Hume. All four birds were obtained near Delhi. Two other birds were seen by Mr. Hugh Whistler and Mr. Whitehead on the Sutlej near Rupar in the Ambala district, and finally another bird was shot by Mr. Marshall at Gurdaspur. In the North-west it is equally rare, and as the authorities who would attempt to prove otherwise are anonymous, it is not worth while quoting them. In Oudh it is perhaps less rare, and a few birds are seen and either shot or netted nearly every year. Latham says that it "is common in Oudh, where it lives generally in pairs, is often kept tame, and becomes very familiar" (!).

Nidification.—What a pity Shillingford has not given us some more details concerning all the nests he seems to have found, and

also of the numerous eggs he obtained ; whether they were like those he sent to Hume, or whether they were like most other ducks' eggs. He did send five eggs to Hume, one of which was, I believe, taken by himself and the others by Mr. T. Hill, of Jeruneah factory, in Purneah.

Of these five eggs Hume remarks :—

“ The eggs are quite unlike those of any other duck with which I am acquainted. In shape they are very nearly spherical, indeed, one is almost a perfect sphere.

“ The shell is very close and compact, but not particularly smooth or satiny to the touch, and is entirely devoid of gloss.

“ In colour it is nearly pure white, with here and there traces of an exceedingly faint yellowish mottling, probably the result of dirt. Even when held up against the light, the shell is white, with scarcely a perceptible ivory tinge.

“ The five eggs sent me by Mr. Shillingford measure as follows : 1.82 × 1.7 inches, 1.78 × 1.68, 1.8 × 1.62, 1.71 × 1.69, 1.81 × 1.61.

“ There is no possible doubt now that these eggs, taken at two different times by two different persons, are really the eggs of the Pink-Headed Duck, but at the same time it must be admitted that they are eggs which no one versed in oology could, without positive proof, have accepted as pertaining to this species.”

An egg in my own collection also taken by Shillingford in Malda agrees exactly with the five described above, but I should call it very smooth and satiny to the touch.

General Habits.—Shillingford's note on the Pink-Headed Duck which appeared in the ‘Asian,’ gives so much information—and so little is to be obtained elsewhere—that I reproduce it *in extenso* :—

“ During the cold weather, November to March, the Pink-Headers remain in flocks varying from eight to thirty, or even forty birds, in the lagoons adjoining the large rivers, and have been observed by myself in considerable numbers in the southern and western portions of the district, that portion of Eastern Bhagalpur which lies immediately to the north of the River Ganges and south-western parts of Maldah. They come up to the central or higher parts of the Purneah district in pairs during the month of April, begin to build in May, and their eggs may be found in June and July. The nests are well-formed (made of dry grass interspersed with a few feathers), perfectly circular in shape, about 9 inches in diameter, and 4 or 5 inches deep, 3 or 4-inch walls, and have no special lining. The nests

are placed in the centre of tufts of tall grass, well hidden and difficult to find, generally not more than 500 yards from water. They lay from five to ten eggs in a nest. Both the male and female have been started simultaneously from the vicinity of the nest, but whether the former assists in incubation is uncertain, though, judging from the loss of weight during the breeding season, the male must be in constant attendance at the nest. The weight of five males shot between the 13th February and 28th June, 1880, in consecutive order, being: (1) 2 lbs. 3 ozs. (13th February); (2) 1 lb. 14 ozs., (3) 2 lbs., (4) 1 lb. 13 ozs., and (5) 1 lb. 12 ozs. (28th June).

"When the young are fledged in September-October, the Pink-Header retire to their usual haunts in the jungly lagoons.

"The following account, as indicating their strong attachment to their young, may prove of interest. On the 17th July, 1880, whilst searching for Pink-Headers' nests with F.H. at the northern extremity of Patraha Patal, where nests were reported, we flushed a female Pink-Header in the grass-jungle on the banks of the Patraha jhil. F.H. fired with his miniature express at a distance of about 300 yards at the bird, which had settled at the other end of the jhil. The ball was seen to strike the water some distance above, and a little to the left of the bird, which did not rise. Upon going up to the spot, to our surprise she fluttered about and dragged herself along with loud quackings. Being closely pursued, she flew along at an elevation of about six feet from the ground in a manner that led us to believe that she was badly wounded, and one of her wings damaged, and she fell rather than settled in a patch of grass on dry land. Upon approaching this a similar manœuvre was gone through, and she deposited herself some hundred yards further on. Having decoyed us thus far, she flew up into the air with such a facility that our old Mahout could not help exclaiming, 'pfair jeegya' (it's come to life again), and directed her flight in a direction away from the piece of water. After describing a considerable circuit, she came back to the jhil on the banks of which we were standing. Two more bullets were fired at her from the same gun, which only made her rise after each shot and settle down again some ten yards further on. Seeing that her tactics had failed in drawing us away from the vicinity of her young, she again took to the grass-jungle, and all endeavours to flush her again proved futile, though she was observed in the same piece of water subsequently."

All observers who have recorded their observations otherwise than anonymously concur in stating this Duck to be one of enclosed waters, and it seems to prefer such as are well covered with jungle and weeds of sorts and surrounded by high grass, forest, etc. It is

probably found sometimes on the open river, but this only in the cold weather and very rarely even then. As a rule, it collects in but small parties, and I should think, very probably, that they are composed only of the members of one family, though two or three of these may now and then join together. Its flight has been described as fast and powerful, and its voice as a musical edition of the mallards.

As regards its food, there seems to be nothing on record beyond Mr. Shillingford's note on the gizzard of a bird he examined and found to contain "half-digested water weeds and various kinds of small shells." This is, however, important, as it shows that it is both an animal and a vegetarian feeder.

Most writers call this a shy and wild bird, but my father (E. B. Baker), who knew the bird well, did not consider it to be either a particularly wary or wild bird, though of a very shy retiring disposition. I remember when I first came out to India, some forty years ago, he had several of these birds' skins amongst his collection of Maldah bird-skins; but all these have been either lost or destroyed, and it is now so long since I last saw them that I cannot speak with certainty of the variations they showed in their plumage.

Most of these ducks had been shot by him when shooting with the late W. Reily and some of the Shillingfords in Maldah and Purneah. At the end of a day's shoot, when promiscuous firing had become the order, one or two of these ducks would often be added to the bag, getting up in front of the line of elephants as they worked through country in which there were any small pools and jhils.

NOTE TO P. 53.

Distribution.—On January 27, 1921, a Pink-Headed Duck was shot in the north of the Kheri district, United Provinces, by Mr. T. B. Hearsey.



THE COTTON TEAL.
Nettopus coromandelianus.
 , $\frac{1}{3}$ nat. size
 female male

Genus NETTOPUS.

Unlike the two last genera, the present one contains four species, though of these only one is found in Indian limits. The type of genus is *Nettopus auritus*, which is found throughout a great part of South Africa and also in Madagascar. The other two forms, *N. pulchellus* and *N. albipennis*, are both Australian, the former being obtained in New Guinea and some other islands.

Nettopus can be distinguished from all other genera by the following characteristics being combined in it :—

Rather long hind-toe, not lobed ; feet palmated ; neck short ; wing under 7 inches.

(10) NETTOPUS COROMANDELIANUS.

THE COTTON-TEAL.

Nettapus coromandelianus, *Jerdon*, *B. of I.* iii, p. 786 ; *Butler*, *S. F.* iv, p. 27 ; *Hume*, *ibid.* ; *Hume & Dav.* *ibid.* vi, p. 486 ; *Oates*, *ibid.* vii, p. 52 ; *Cripps*, *ibid.* p. 311 ; *Legge*, *B. of Cey.* p. 1066 ; *Bingham*, *S. F.* ix, p. 198 ; *Oates*, *B. of B. B.* ii, p. 272 ; *Hume*, *Nests and Eggs* (*Oates*' ed., iii, p. 280) ; *Barnes*, *B. of Bom.* p. 397 ; *Stuart Baker*, *J. B. N. H. S.* xi, p. 191.

Nettapus coromandelicus, *Hume*, *Nests and Eggs*, p. 638 ; *Hume & Marsh*, *Game-B.* iii, pl. 14.

Nettapus coromandus, *Hume*, *S. F.* iii, p. 192.

Nettopus coromandelianus, *Hume*, *S. F.* vi, p. 491 ; *id.* viii, p. 114 ; *id.* Cat. No. 951 ; *Hume & Marsh*, *Game-B.* iii, p. 101 ; *Oates*, *S. F.* x, p. 245 ; *Salvadori*, *Cat. B. M.* xxvii, p. 68 ; *Young*, *J. B. N. H. S.* xii, p. 573 ; *Butler*, *ibid.* xiii, p. 154 ; *Mono*, *ibid.* xv, p. 515 ; *Parrington*, *ibid.* xv, p. 143 ; *Blanford*, *Avifauna of B. I.* iv, p. 433 ; *Oates*, *Game-B.* ii, p. 127 ; *Stuart Baker*, *Indian Ducks*, p. 47 (1908) ; *Mitchell*, *J. B. N. H. S.* xxiii, p. 584 (1915) ; *Kinloch*, *ibid.* xxvi, p. 674 (1919).

Description. Adult Male.—Extreme point of forehead white, remainder and crown brown, the lateral edges much darker, almost black; a complete broad collar round the base of the neck black, a little glossed with green; remainder of head, neck, lower plumage, and a collar behind the black collar white; flanks most minutely stippled, and more or less barred, with light-brown, sometimes almost absent; under tail-coverts broadly barred and tipped or subtipped brown; scapulars and back dark-brown, completely overlaid with dark-green gloss slightly mixed with purple; upper tail-coverts dirty white, freckled with brown. Innermost secondaries brown glossed with purple, remaining secondaries glossed green and tipped with white; primaries glossy-green tipped brown, and with a broad white band continuing the bar made by the white tips of the secondaries; tail brown.

Colours of soft parts.—Bill, legs, and feet black, the two latter more or less tinged with slaty-yellow; irides bright crimson-red.

“Sides of tarsus and toes dusky yellow; claws horny-brown.”
(*Oates.*)

Measurements.—Length 12·5 to 13·5 inches, wing 6 to 7 (rarely over 6·6 or under 6·3), tail about 3, culmen about '9 to '95, tarsus 1. Weight between 9 and 12 ozs.

Female.—Cap as in the male, but uniform brown; forehead more broadly speckled with brown; a deep brown line running through eye; remainder of head and lower plumage white, the breast and lower neck with narrow bars of dark-brown, taking the place of the collar in the male; face and neck much vermiculated with brown, and the flanks both barred and speckled with the same. In old females the abdomen and centre of the breast are pure white, in younger birds more or less marked with brown; outer secondaries broadly and inner primaries very narrowly tipped with white; remainder of the wings, upper plumage, and tail brown, the scapulars and back being occasionally faintly glossed, upper tail-coverts finely stippled with white.

Colours of soft parts.—Bill brown or dark-olive, paler and yellowish on mandible, commissure, and gape. Iris red-brown; legs and feet dull slate-yellow, more or less smudged with blackish-green; claws light yellow-brown.

Measurements.—Length about 12 inches, wing 6 or a trifle over, tail about 2·75, culmen about '9, tarsus nearly 1.

Male in Winter.—“Similar to the female, but always retains the conspicuous white patch on the primaries.” (*Salvadori.*)

Does this little duck always assume a winter plumage when fully adult? I doubt it, for I have males shot in early winter just as glossy and fully-plumaged as any to be obtained during the breeding-season and hot weather.

Young.—Like the female, but even more striped about the head with brown, and also more banded with light-brown on the flanks.

Young in Down.—“Upper parts, flanks, and under tail-coverts blackish-

brown; a broad superciliary stripe, cheeks, throat, front of neck, and breast white; a brown line through the eyes; two broad white spots on each side of the back, one near the base of the wings, and the other, much longer, on the sides of the rump; feathers of the tail blackish, very long and stiff." (*Salvadori*.)

Distribution.—The Cotton-Teal is found almost throughout India, Burma and Ceylon, and extends also to China and the Philippines, Sunda Islands, and the Celebes.

In India proper it may be said to have its stronghold in Eastern Bengal, is still very common in Western Bengal and Assam, less so in the Eastern Punjab and Rajputana, especially so in cold weather, and actually rare towards the west of the Empire. Barnes says that it is not found either in Guzerat or Sind, but it has been recorded from both places since his book was written.

Mr. J. W. Parrington records having shot it near Sujawal in Sind, and Mr. E. L. Barton records the following from Guzerat:—

1897.	On 17th January, at Pardi, Surat	...	5	Cotton-Teal.
"	24th	"	1	"
"	13th February	"	9	"
1898.	18th December, at Lohdere, Ahmedabad	1	"	
"	23rd	at Ahdura	1	"

E. H. Young reports it as occurring in fair numbers in the Panch Mahals, and it is also reported from Guzual by A. H. Mene.

In Orissa it is common enough, and in parts of Madras fairly so; from Malabar it has been reported by Mr. A. M. Kinloch. In Ceylon it appears to be more or less confined to the north and east of the island.

Legge writes ('Birds of Ceylon,' p. 1067):—

"This pretty little bird is common in the tanks of the northern and eastern parts of the island, breeding in many secluded spots, and moving about considerably during the rainy weather. To the Western Province and south-west of the island it is apparently chiefly a N.E. monsoon migrant, as about Christmas-time it is met with on the Kotte and Kaesbawa lakes and other similar sheets of water."

In Burma it appears to be found everywhere as far south as Tennasserim and Tavoy.

Butler reports it in his list of Andaman birds as having been obtained by G. Wardlaw-Ramsay and Captain Wimberley.

Mr. F. J. Mitchell shot a specimen of this little Teal at Holdra jheel in Kashmir in October, 1914.

Nidification.—The only district in which I have personally found and taken their nests in any number is Rungpore. I was there in 1885 for three or four months in the rains, and I am sure that at that time a short walk of two or three miles in any direction, along any road, would have been productive of three or four nests of Cotton-Teal, as well, perhaps, of one or two of whistling-teal. The district and station roads are well off for fine large trees, forming complete avenues on many of them, and most of them have also large drains on either side, or else a succession of borrow-pits take their place. These, long disused, have naturally become well covered with weeds and grasses, and form grand hunting-grounds for this little duck, whilst the numerous hollows in the old trees which overhang them afford sites for building in. I think they generally select hollows of some size in the trunk of the tree itself, and at about 6 to 12 feet from the ground, and this hollow they line well and abundantly with twigs, grass, and feathers. I have twice known as many as 22 eggs laid, once 18, and once 16, but, normally, I should say they lay any number from 8 to 14, 10 being, perhaps, the number more often laid than any other. I have never known them make any other sort of nest than this already described, but others have recorded quite different stories regarding their nidification. Blewitt, writing from Jhansi, says:—

“It breeds in July and August. Just above the village of Borogaon is a large lake, from which several eggs of this goslet were brought. The eggs were collected in two months on different occasions. It makes a semi-floating nest on the water among the rushes or lotus weeds, of weeds, grass, etc., all together, filled up several inches above the water-level.

“The many boatmen of this lake stated that this goslet breeds there every year, and at the Salbuhat Lake also the boatmen affirmed the same.”

I have found nests quite low down, in holes in trees only just above water-level in fact, but have never taken them from a hole at any height from the ground, and cannot now recall to mind any

which were over 15 or 16 feet from it. They do, however, sometimes select very lofty situations, for Oates took one nest containing ten eggs from a mango-tree about 30 feet above the ground. They are said also to breed sometimes in old ruins, broken-down walls, etc. Cripps says : "They even lay their eggs in the factory chimney holes." They do not always make use of places quite close to water, as a pair of these birds laid their eggs in a gigantic tree standing in the magistrate's compound in Rungpore. At the back of the house there was a good-sized tank, frequented by a pair of these birds, and as they were so constantly present, I hunted all round the tank, in every tree, for the nest. However, it was not to be found, though holes and hollows which looked suitable for nesting-purposes were common enough. Eventually I found the nest by accident in a tree in front of the house and full 200 yards from the tank. This was one of the nests already mentioned, which contained twenty-two eggs. I watched this nest very carefully, and on the sixteenth day after it was found the chicks were hatched, and I then waited anxiously to see how they would get to the water. They remained in the nest that day, but the following morning, though I was out very soon after daybreak, they were all in the tank, 15 out of the 22, 7 eggs being addled, which I took.

It was a great disappointment not seeing the goslings taken from the nest to the water, and I have never yet seen it done. A very intelligent native once told me that early one morning, before it was light, he was fishing in a tank, or rather looking to his nets which had been put down overnight, when he saw something flutter heavily into the water from a tree in front of him and some twenty paces distant. The bird returned to the tree, and again with much beating of the wings fluttered down to the surface of the tank, and this performance was repeated again and again at intervals of some minutes. At first he could only make out that the cause of the commotion was a bird of some kind, but after a few minutes, he, remaining crouched among the reeds and bushes, saw distinctly that it was a Cotton-Teal, and that each time it flopped into the water and rose again it left a gosling behind it. These, he said, he could see were carried somehow in the feet, but the parent bird seemed to find the carriage of its young no easy matter, and flew with some

difficulty, and fell into the water with some force. I do not vouch for this man's story being true, but give it for what it is worth, and believe it myself.

They breed in Bengal in late June, July, and August, the end of July principally. In Ceylon they are said to breed much earlier, but there, of course, the weather arrangements are different, and birds of all kinds have to make their nesting-time suit accordingly.

The eggs are true duck eggs, though more spherical than most, much like those of *Dendrocygna* in shape, texture, and polish. Oates calls them minatures of those of the Comb-Duck, but says they are less glossy.

They vary in length between 1·5 and 1·8 inches, and in breadth between 1·17 and 1·41. The average of eighty eggs, including the twenty-six mentioned in Hume's 'Nests and Eggs,' is exactly 1·7 by 1·3 inches.

Cripps, in blowing an egg of this bird, noticed that the drops as they fell on to a pucca floor appeared phosphorescent. He could give no reason for this, but the fact that they did so certainly deserves mention in any article on the Cotton-Teal.

General Habits.—In certain of the drier portions of its habitat, this bird is semi-migratory in its habits, only visiting them in the rains, and leaving again for some more suitable place as the haunts in the former begin to dry up.

Hume, referring to the vast numbers seen every day during the cold weather in the Calcutta market, says it is a mystery to him where they come from. Having myself shot over some of the vast bhils and backwaters of the Ganges and Brahmapootra, I think it would take a very large number indeed to surprise me. In the places mentioned they simply swarm in thousands and are only out-numbered by the whistling-teals.

Probably every one knows how the fishermen of the Sunderbands and other parts of Eastern India net the vast numbers of duck that are daily sent into the Calcutta market, but in case there are some who do not, the following may explain. Over a great stretch of shallow bhil they erect nets some fifteen to twenty feet high, usually selecting the end of a large patch of water where it narrows off either into dry land or forms a neck into yet another bhil. Then

by night they pole silently up the lake towards the nets, driving the flocks of duck and teal silently before them, nor is any noise raised until an approach has been made to within some 100 yards or even less of the nets. Thus when the shouts are started many of the flocks have not had time to rise high enough to evade the nets, into which they fly and are entangled. Cotton-Teal, of course, fly low along the surface of the water, and hence fall victims to the nets more easily than such ducks as get quickly into the air and fly high. On the Moolna bhil I am sure forty or fifty couple might be shot in a day by a single gun without any very great trouble or luck; but in Bengal very few sportsmen, except such as shoot for quantity alone, consider them game, and Cotton-Teal are left alone, unless required as food for servants, boatmen, or coolies, who like their flesh and eat it greedily, preferring them to more delicately-flavoured ducks. They breed in great numbers in these vast sheets of water on the little islands which are dotted about in all directions, and which contain from three to four up to 100 trees or so. Nor are they much molested when breeding, though now and then the miserable fishermen, who are the only inhabitants of these watery, fever-stricken parts, may take a clutch or two of eggs as food.

In different parts of India their habits also vary very much. Hume writes:—

“ Tame and familiar little birds, village ponds, at any rate where singhara are grown, seem to be just as much affected as more secluded pieces of water. You may often see half-a-dozen dabbling about in the water and weeds within ten yards of the spot where the village washerman is noisily thrashing the clothes of the community, *more suo*, on large stones or ribbed pieces of wood, as if his one object in life was to knock everything into rags at the earliest possible moment. Even the loud half grunt, half groan, with which he relieves his feelings after each mighty thwack has no terror for these little birds.”

The habitat of these remarkably domesticated Cotton-Teal is not mentioned by Hume; but in Rungpore, though not quite so tame as the above description shows them to be in some places, they take little notice of passers-by unless very closely approached. They squat in the roadside ditches and tanks, and, when finally leaving them, scuttle away, chattering and clucking for all they are worth,

as if trying whether they could vociferate harder than fly, or *vice versa*, often only to return to some spot within fifty or sixty yards of that just left. Their flight is decidedly quick as well as fast, and they dodge round corners and avoid stumps and other obstructions which come in their way as they fly down the wayside drains and ditches with an activity quite wonderful. In addition to their speed of flight they are very densely plumaged and tough, and carry off a wonderful lot of shot for so small a bird. In the Sunderbands they are found alike in the very biggest and broadest stretches of water as in the smallest; only in the former they keep much to weedy places with thick cover adjacent. In Rungpore, Furreedpore, Barisal, and adjoining districts they keep more to small tanks, ditches, and enclosed bhils than to the larger, more open pieces of water; and this is said to be their practice in most other parts of their habitat. Legge says that they frequent sometimes the flooded lands close to the seashore.

I have generally observed them in rather small flocks, seldom more than about twenty, and more often under than over a dozen—that is to say, in family-parties only; other observers, however, speak of finding them in larger flocks, so I suppose that often the families collect together, and on one occasion in Dibrugarh I saw a flock of fully 100 birds.

The Cotton-Teal has often been unjustly accused of being unable to progress on land. I do not know how this idea was started, but it is quite without reason. Mr. Finn, then of the Indian Museum, Calcutta, states that his birds, which he had in captivity, walked perfectly well, and suggests that the idea arose from people seeing wounded birds shuffling along. I think there may be, however, another explanation. I had once a pair of tame Cotton-Teal which were allowed to wander about where they liked, though I had to keep one wing clipped, or they might have wandered too far and got shot. Now, under ordinary circumstances, the two little birds waddled about in complete comfort though without any undue speed. When under the effects of excitement, however, whether pleasurable or frightened, they attempted to hurry themselves, they at once flopped about in the most ludicrous fashion, tumbling over every little obstruction they met with, and appearing as if their hind-quarters were going too fast for their heads and breasts to keep in front.

Genus *ÆX.*

According to the British Museum Catalogue the Mandarin Duck is included in the *Plectropterinæ*, and the key is as follows:—

No comb on base of bill.

Head crested *Æx.*

Both Ogilvie-Grant and E. Oates, however, pointed out to me that a far better generic character is provided in the silver-grey edging to the primaries, a character by which it may be at once distinguished from any other Indian duck.

(11) *ÆX GALERICULATA.*

THE MANDARIN DUCK.

Anas galericulata, *Lath. Ind. Orn.* ii, p. 871.

Aix galericulata, *Gould, B. of Asia*, vii, p. 89; *Oates, Game-B.* ii, p. 136; *Finn, Fancy Water-Fowl*, p. 26; *Bennett, Wanderings in New South Wales*, ii, p. 62; *Latham, Syn.* iii, p. 548.

Æx galericulata, *Salvadori, Cat. B. M.* xxvii, p. 76; *Stuart Baker, J. B. N. H. S.* xiv, p. 626 (1903); *id. Indian Ducks*, p. 54 (1908); *Stevens, J. B. N. H. S.* xxiii, p. 734 (1915).

Description. Adult Male.—Supercilium from the base of the bill to the end of the crest pure white; forehead to nape glossy-green, thence the long thick crest is metallic-purple, more or less mixed with green on the basal half and entirely green on the terminal third, which is sometimes shot with deep-blue; face and sides of the head buff, shading into white round the eye and into cinnamon-red on the posterior cheeks, chin and throat; the neck-hackles are bright-chestnut, tipped with purple and with white striæ on the anterior portion; remainder of upper plumage and lesser wing-coverts dull-brown glossed with bronzed-green, especially on the mantle and upper tail-coverts; tail grey-brown glossed green. Lower neck and sides of breast

brilliant purple-copper ; sides of lower breast with three bands of black and two of white ; remainder of lower parts white ; flanks vermiculated black and brown, but with copper bars opposite the vent and with black and white bars at the end of the flank-feathers. Scapulars grey-brown, the innermost completely glossed with deep-blue and the median with green, the change being graded and not clearly defined ; the outermost are white with broad black edges. The innermost secondary, which is enormously broadened into a fan-shape, is chestnut on the inner web, tipped paler on the outer half and with blue on the inner, on the outer web of the secondary the tip is chestnut, the remainder deep glossy-blue ; other secondaries brown, with the outer web glossed green and tipped white, except the one next the innermost which is all of this colour ; primaries brown, glossed green, and with broad edges of silver-grey on the outer webs. Axillaries brown ; under wing-coverts mixed brown and grey.

In one specimen in the British Museum the whole chin, and in another the border of the angle of the chin, is white.

Colours of soft parts.—“ Iris dark-brown with a yellowish-white outer ring ; bill reddish-brown, with the nail bluish flesh-coloured ; tarsus and toes reddish-yellow, membranes blackish.” (*Schrenk.*)

Measurements.—Wing 8·8 to 9·4 inches, tail 4·2 to 4·6, bill, culmen 1·1 to 1·25, from gape 1·5 to 1·45, tarsus 1·3 to 1·4, length about 16 to 18.

Adult Female.—Head and full crest grey, a narrow line starting above the eye and passing round the front to the back and bordering the crown white ; sides of the head pale-grey, grading into the white of the chin, throat and upper neck ; the face is sometimes broadly white and sometimes wholly grey, and at other times there is a broad or narrow band of white next the bill ; whole remaining upper parts and wing-coverts brown, more or less tinged with grey or olive-green ; lower neck, breast, sides, and flanks the same colour as the back, each feather with a pale spot near the tip, these being very large on the flanks ; remainder of lower parts white ; primaries brown, slightly glossed green and broadly tipped white, two of the inner secondaries forming a deep blue-green speculum, submargined black and margined white ; innermost secondaries the same colour as the back.

As with other Ducks with white under parts, these are often more or less tinged with rusty.

Colours of soft parts.—As in male.

Measurements.—Wing about 8 inches, tail about 4, bill, culmen 1·05 to 1·20, from gape 1·2 to 1·32, tarsus 1·2 to 1·3.

The male in post-nuptial plumage resembles the female, but this sex, as Oates points out :—

“ may be separated from males by the oblique white stripe which may always be found on the outer web of the first purple feather of the speculum. This stripe is just below the tips of the wing-coverts and is always absent in the male.”

The young male in first plumage also resembles the female with the

exception just noted; it is, however, generally rather bigger and often more clearly coloured.

Amongst the first indications of sex-plumage assumed by the young male is the deepening of the plumage of the breast and upper neck. A specimen (δ) in the British Museum collection shows this beautifully, and looks much as if the change here undergone was one of colouration in the feathers themselves.

The same bird has the broad secondary partially developed, but has no white edging to the outer web, so presumably this is not assumed until the second year; this feather is also not so much falcated as in the adult bird. The adult colouration of the scapulars is only indicated by a few blue tints, but the black and white bars on the sides of the breast are well advanced.

Nestling.—Above hair-brown, the edge of the wing pale-buff and two indefinite bars of the same colour on the sides, one in front and one behind the thigh. Under parts wholly pale-buff; a dark-brown streak running from behind the eye to the neck and another from behind the ear-coverts.

Distribution.—The Mandarin is a purely Eastern Asiatic Duck, being distributed, according to Salvadori, throughout "Central and Southern China, Formosa and Japan; Amoorland only during the breeding season." It has also been obtained in Corea, and once in India, in Lakhimpur, Assam.

It is not long since Oates wrote: "This beautiful duck is not unlikely to be met with on the borders of the Shan States"; but it has now been obtained far more west.

Nidification.—As regards its nidification, very little is known; it seems to breed everywhere through the north of its range, perhaps also wherever it is found. It appears, however, to visit the Amoor and the more northern extremes of its habitat only during the breeding-season, so that it is probably locally migratory. It is one of the species of ducks which build in trees, and in captivity breeds very freely.

W. Evans in the 'Ibis' (1891, p. 73), giving the period of incubation for various birds, gives that of this duck as thirty days, whilst Finn gives it as twenty-six. In the Zoological Gardens up to 1874, the Mandarin had hatched eggs no less than twenty-six times, the earliest date for the young to appear being the 31st May, 1858, and the latest July 16th, 1874. As the normal climate in which the duck breeds is not unlike the English climate, except in the extreme north, these dates will probably coincide with its breeding-season when in its

natural state. The British Museum possesses five eggs of *Æx galericulata*, which measure $2\cdot2 \times 1\cdot6$ inches, $2\cdot15 \times 1\cdot54$, $2\cdot15 \times 1\cdot6$, $2\cdot08 \times 1\cdot56$, and $2\cdot16 \times 1\cdot52$. In shape these eggs are very regular ellipses, and slightly compressed at one end. The texture is smooth and close and distinctly glossy, and the colour is a very pale fawn or yellowish-white. One egg was originally, perhaps, rather darker in colour than the rest, but is so soiled that it is difficult to say with any certainty. All these eggs were laid by birds in captivity. The eggs in my own collection agree well with these, but are rather more clearly coloured, perhaps because fresher when blown. Their dimensions agree with those given above.

General Habits.—Mr. A. Stevens, who shot the only Indian specimen ever obtained which is now in the Tring Museum, tells me, in *epistola*, how he managed to get it. He writes:—

“ Early one dull morning I went in a dug-out down the Dibru river on a collecting trip. The Dibru, then very low, is a small stream varying between twenty and fifty yards wide, here and there dotted with sandy banks and islands, and for the most part densely covered with jungle down to the water's edge. Twice single specimens of *Asarcornis scutulata* (the White-winged Wood-Duck) passed down the river on the way to their favourite haunt and held forth hopes of something good to be had later on. I had gone some two miles down the river, and had come to a place where it widened out and then divided into two branches. Here there was a small sandy chur (bank), and on this I saw six ducks, but what they were I was still too far off to determine. Four of the ducks were close together, two a little apart, but all six appeared to me to be exactly identical in size and colouration. Selecting the two birds which were the nearer to me, I fired both barrels at them, upon which all six birds rose and flew ahead. I was certain, however, that my shot had told, nor was I wrong, for one bird, after flying some forty yards, dropped into the water. Picking the bird up I at once recognized that it was something new to me, but at the same time had no idea of the value of what I had got. Consequently, although I repeatedly flushed the pair to this bird, I made no attempt to shoot it, even though it got up well within range and gave me easy shots.

“ The birds, when first flushed, flew away strong and low, but the single bird which I afterwards put up reminded me of the stupid performance of the Little Green Bittern (*Butorides javanica*) in the way it flew from the bank and across and down stream, only instead of selecting a small tree to perch on, he always managed to drop into

the long elephant-grass, which, with other jungle, bordered the stream.

"We found the flesh of this bird very coarse, a fact which saved the pair on several occasions afterwards when I saw it. Eventually, when I learnt the value of my acquisition, I, of course, never again saw it."

This is the only occasion on which the Mandarin has actually been obtained in India beyond all doubt.

I was, however, once told by a sportsman that he had shot a Marbled Teal in Assam, and when asked to describe it he gave a very minute and accurate description of a female Mandarin. This bird had been shot by him near Margherita, in the Dibrugarh district of Assam, the same district as that in which Mr. Stevens shot his bird.

Again, Mr. Gruning, I.C.S., and myself saw six birds on the river Ranganadi, which I am sure were of this species. We were going along in a small launch, and the birds flew across us so close that we could see their silver-grey heads and the clear white speculum; unfortunately we had no guns ready, and the birds flew straight away. Their flight was very strong and quick, much like that of *Nettion crecca* (the Common Teal), but less swift than that of that bird.

This splendid little duck is one far better known in a captive than in a wild state. Long ago Latham wrote:—

"We do not find it nearly so common in China as many other birds and the common price is from six to ten dollars a pair nor can they be bred in this country."

Blakiston and Pryer, in the 'Ibis' (1878, p. 213), state:—

"Very common on small streams. It formerly built in the trees in Uyino Park, Tokio. Breeds in Yezo."

It seems to be a duck which keeps much to small streams, more especially such as run through forest, but at the same time to prefer such streams as are clear rather than slow sluggish backwaters and weedy pools. It is usually to be found in small flocks, seldom exceeding a dozen, and very often less, even in the countries where it is most common, so that very small flocks are all we can expect to meet with in India or Burma.

It is a stout, sturdy little bird, equally good on water, and land, and in the air; its flight is direct and strong, similar, though inferior in speed to that of the Common Teal; it walks well and quickly, and swims with a jaunty carriage, getting over the water at a great pace. I can find nothing on record about its powers of diving, but, judging from its shape and plumage these are not likely to be of the best.

Schrenk says that when in Amoor, about May to August, they are very wild and shy, not allowing an approach within gunshot; he also states that they perch freely on trees. This is confirmed by all other observers; indeed, Finn ('Fancy Water-Fowl') says that the Mandarin perches as readily as a pigeon.

This same naturalist, one of our best observers and a specialist on Water-Fowl, remarks:—

"Another attractive point about this lovely Duck is that he, more than any other duck, is a bird of position, and much given to showing himself off by raising his crest and slightly expanding his wings vertically, so as to bring the wing-fans perpendicular and to display the beautifully striped flights, while when standing he often curves his neck back and throws out his breast like a Fantail Pigeon. He certainly looks at such times as if he were conscious of his beauty, and his little brown mate, as she caresses his orange hackles, must surely admire him.

"He is a great fighter, and will even kill ducks of his own kind should he not approve of them."

In spite of their pugnacity, however, they have a reputation in China for being wonderfully faithful little birds to each other. Indeed, Canel says (p. 155) that:—

"A pair of these birds are frequently placed in a gaily decorated cage, and carried in their marriage processions, and are afterwards presented to the bride and bridegroom as worthy objects of their emulation."

The same author, in describing their flight, writes:—

"Whilst on the wing these parties crowd closely together in front, whilst the birds in the rear occupy a comparatively free space."

Subfamily ANSERINÆ.

This subfamily contains, according to Salvadori, six genera, but other systematists have further considerably divided these again.

Thus the Bar-Headed Goose has been placed in a genus, *Eulabeia* (Reichenbach), by itself, and the Bean-Geese have been separated from other geese and called generically *Melanonyx* (Buturlin). The only other genus which interests Indian sportsmen and ornithologists is *Branta*, of which one species, *ruficollis*, undoubtedly visits our limits.

The only genera we need recognize for the purpose of this work are *Anser* and *Branta*, and I propose to deal with Alphéraky's *Anser*, *Melanonyx*, and *Eulabeia*, all under the former title. The generic differences, if they do amount to such, are very slight, and there appears to be no need to confuse readers more than can be helped.

The distinctive features of the subfamily are: the hind-toe is not lobed, and moderate in length, as is the neck, the feet are palmated, and there is no cere.

As regards India the following key to the genera will suffice:—

Neck and breast with no bright rufous colouration. *Anser*.

Neck and breast extensively coloured with bright
rufous : *Branta*.

Since the article dealing with the true geese appeared in the Bombay N. H. S. Journal, certain specimens of geese have been obtained, of which two species, *Anser brachyrhynchus* and *Anser arvensis sibiricus*, have been satisfactorily identified, and others of which the identity has not been *absolutely* made out, but which I have dealt with under the headings to which I *believe* they belong: also *Branta ruficollis*, although not actually obtained, has been sufficiently well identified to allow us to include it in the Indian avifauna.

The Bean-Geese have been dealt with at great length by Alphéraky in his magnificent monograph of 'The Geese of Russia and Asia,' and, because of the mass of material he has had at his

disposal, and the length of time and study he has devoted to the subject, the results he arrives at will probably be eventually found to more closely approach correctness than the attempts of other ornithologists, who have not had the same advantages. At the same time, it is more than possible that even Alphéraky would now modify much that he has written, and other species and subspecies may be created, and some of those now accepted done away with.

In India we *may* meet with specimens of many of the Bean-Geese, and for this reason I have, in my key to the Anseres, included several forms of which we have, as yet, no record.

Further investigation, more especially that of Dr. Hartert, has led to the change of several names, the suppression finally of certain subspecies, and to the reversion in one or two cases to better-known names.

Genus ANSER.

The only Indian Goose which has a red breast belongs to the genus *Branta*, and cannot be confused with any of the birds of this genus, which are all coloured with black and white and the intermediate shades.

Key to Species.

- A. Head with two black bands *A. indicus.*
- B. Head with no black bands.
 - a. Nail of maxilla white or nearly so.
 - a¹. No white or very little white on forehead.
Rump grey *A. anser.*
 - b¹, A good deal of white on forehead, round base of bill. Rump dark greyish-brown.
 - a². Wing over 15 inches *A. albifrons.*
 - b². Wing under 15 inches *A. erythropus.*
 - b. Nail of maxilla black or nearly so.
 - c¹. Margin of wing ashy blue-grey, upper wing-coverts light slaty-grey *A. brachyrhynchus.*
 - d¹. Margin of wing and wing-coverts dark brown or blackish-brown.
 - a². Pale-coloured parts of bill rose-pink . . . *A. neglectus.*
 - b². Pale-coloured parts of bill yellow.
 - a³. Nail less than quarter length of culmen.
 - a⁴. Culmen 1'88 to 2'40 inches . . . *A. fabalis fabalis.*
 - b⁴. Culmen 2'44 to 2'83 inches . . . *A. fabalis serrirostris.*
 - b³. Nail more than quarter length of culmen.
 - c⁴. Culmen 2'16 to 2'83 inches . . . *A. arvensis arvensis.*
 - d⁴. Culmen 2'91 to 3'26 inches . . . *A. arvensis sibiricus.*

The above is admittedly only a very rough key, but should suffice to enable sportsmen to discriminate between their specimens, should they be so fortunate as to obtain any of the rarer species.

Considerable discussion has been carried on in the pages of the 'Bombay Journal' in regard to the Bean-Geese, between Alphéraky, Buturlin, and Oates, and those who wish to study the question should consult pp. 38, 598, and 950 of vol. xvii of that journal.

Anser fabalis fabalis and *Anser arvensis arvensis* if accepted are probably western forms, hardly likely to be found within Indian limits; but as it is within the bounds of possibility that they will be so found, I have included them in the key.

A brachyrhynchus may be at once distinguished from all other Bean-Geese by its grey coverts, and although the first Pink-footed Goose obtained by me was undoubtedly of this species, there is no chance of its occurrence being anything but extremely rare in India, and we should expect it in the N.W. rather than in the N.E. On the other hand, there is not the slightest reason why *serrirostris*, *neglectus*, and *sibiricus* should not be frequently reported within our borders.

Any sportsman who may obtain a Bean-Goose, i.e., a goose with a black nail to its bill, should at once forward the whole skin, if possible—if not, the head and neck,—to the Bombay Natural History Society for identification. He should note in detail the colouration of the bill and feet immediately he gets it; and if the colours of the former change after death should note this also. The length of the wing should also be added.

(12) ANSER ANSER.

THE GREY LAG GOOSE.

Anas anser, *Limn.*, S. N. Ed. x, p. 123 (1758), (Sweden).

Anser cinereus, *Jerdon, B. of I.* iii, p. 779; *Hume, S. F.* i, p. 258; *id. Nests & Eggs*, p. 635; *Butler, S. F.* iv, p. 26; *Scully, ibid.* p. 199; *Hume, S. F.* vii, p. 491; viii, p. 114; *Hume, Cat.* No. 945; *Hume & Marsh Game-B.* iii, p. 50; *Hume, Nests & Eggs* (Oates' ed.) iii, p. 279; *Barnes, B. of Bom.* p. 945.

Anser rubrirostris, *Salvadori, Cat. B. M.* xxvii, p. 91; *Stuart Baker, J. B. N. H. S.* xi, p. 348; *id. Indian Ducks*, p. 63 (1908); *Harington, J. B. N. H. S.* xxi, p. 1088, (1912); *Bell, ibid.* xxii, p. 400 (1913); *Cotton, ibid.* p. 803 (1914); *Inglis, ibid.* xxiv, p. 600 (1916).

Anser ferus, *Stephen, Gen. Zool.* xii, pl. 12, p. 28 (1824); *Blanford, Avifauna B. I.* iv, p. 410; *Hopwood, J. B. N. H. S.* xviii, p. 433 (1908); *Harington, ibid.* xix, p. 312 (1909); *Whitehead, ibid.* xx, p. 977 (1911); *id. ibid.* xxi, p. 158 (1911); *Radcliffe, ibid.* xxiv, p. 167 (1915); *Ludlow, ibid.* xxv. p. 305 (1917); *Thornhill, ibid.* p. 488 (1918); *Whistler, ibid.* xxvi, p. 190 (1918); *Jones, ibid.* p. 620 (1919).

Anser anser, *Oates, Game-B.* ii, p. 42; *Alphéraky, Geese*, p. 24; *Stevens, J. B. N. H. S.* xxiii, p. 733 (1915).

Description. Adult Male.—Lower back and rump french-grey; upper tail-coverts white; remainder of upper plumage, head, and neck ash-brown, the scapularies edged lighter; a very narrow white rim of feathers at the base of the bill; lower neck in front, breast, and abdomen pale greyish-brown; the abdomen with more or less broad blackish spots, sometimes almost confluent, at others almost absent; remainder of lower plumage white; flanks brown, tipped pale french-grey, more grey at the bases of the feathers; shoulder of wing and smaller coverts next it, winglet, primaries at the base, and primary-coverts french-grey; remainder of wings brown, the secondary coverts edged whitish; under wing-coverts and axillaries french-grey; two outer pairs of tail-feathers white, the central ones brown, tipped white, and the others brownish at the base changing to white at the tip.

Colours of soft parts.—“The irides are always brown; the nail of the bill sullied white, generally yellowish or pinkish-white; the bill, legs and feet vary from creamy-white, with only, in places, a faint tinge of pink, through pale somewhat livid fleshy-pink to a dingy livid purplish-red, and very often the bill is of one shade, the legs and feet of another. Never, in

any of the innumerable specimens that I have examined in India, have the bills had any orange or yellow tint about them." (Hume.)

Measurements.—"Length about 33 inches, wing 18, tail 6·5, culmen 2·7, tarsus 3·2." (Salvadori.)

Female.—Only differs in being smaller. Scully, 'Stray Feathers' (*loc. cit.*), gives the measurements of the female as follows: "Length 31 inches, tail 6, tarsus 3, bill from gape 2·7."

The Young are far less marked underneath, and the majority of birds shot in India will be found nearly white underneath. In the same place as that in which he gives the above dimensions for a female, Scully gives others of a young bird: "Length 30·5 inches, expanse 60·25, wing 16·5, tail 6·3, tarsus 3, bill from gape 2·65. Weight 5 lbs. 10 ozs."

The Indian bird is said to differ from *Anser anser* (the Common Wild Goose) in being rather larger and with proportionately larger bill and feet, and the adult bird is also said to be more marked with black on the underparts, though this last distinction does not hold good with most Indian specimens.

Alphéraky, in his beautiful book on European and Asiatic Geese, shows that our Indian form of Grey Lag is *not* entitled to a separate specific name, nor does he even consider it worthy of subspecific rank. He writes that he is unable to find any points differing sufficiently constantly to enable him to divide the two forms.

Weight and size he shows to be of no value, for whereas the normal Indian bird—this must be *rubrirostris*, if there is such a bird—weighs only some 6 to 8½ lbs., Naumann gives the weight of a western European specimen as being 16½ lbs.

Richness of plumage may be admitted as individual, not specific at all.

This leaves only the *comparative* size of the bill and colouration of the soft parts as a means of differentiation considered hitherto by naturalists.

The bill is said to be proportionately longer in the eastern than in the western form, and the feet and bill more deeply tinged with pink. Personally I cannot discriminate between the two forms.

Hume, in 'Game-Birds,' goes into the question as to whether this bird is the same as the one known in Europe as *Anser cinereus*, and he there notes the difference between the two species in his usual accurate manner, and a few ornithologists agree with him that the two are distinct races. If so, Hodgson's name of *rubrirostris* stands good for our Indian form. Hume's distribution given in 'Game-Birds' applies, of course, to both, and would have to be greatly curtailed in its limits outside India, if the birds were separated.

Distribution.—In the British Museum Catalogue, the distribution of this goose is given as "Siberia in winter, Northern India and Southern China"; this, of course, includes all the intervening countries, at all events whilst the birds are on migration.

It is found throughout Northern India, but it is far more numerous to the west than to the east, and it extends right away throughout China. It occurs in some numbers throughout Assam, but certainly is not a very common bird anywhere in that province, as far as I can ascertain, except on the Brahmapootra, when migrating north or south. Mr. Eden, however, says that it occurs in great numbers in Sylhet, in a favourable year. Probably it is in great numbers only when compared to the few found of other species.

Mr. Damant reports it to be common in Manipur, next door to Burma; and as regards Burma itself, Oates writes:—

“ It occurs on the Chindwin and Irrawaddy rivers, and in the latter river it is abundant down to Myingyan, at least.”

A friend, *in epistolā*, writing from Burma, remarks:—

“ I cannot think how it is that the Grey Lag has not yet been recorded from Burmah. I found it in thousands on the Irrawaddy, and also on some large bheels, a considerable distance from the banks of the river.”

Harington and Bell also record the shooting of large numbers at Toungyi, etc. I have shot one or two pairs in the Sunderbands, but have seen very few birds indeed in that part of the country, and, I think, east of Calcutta it is decidedly rare; indeed it is not common even in the Calcutta markets, which are a veritable bird-mine for the ornithologist in the right season, when the rarer edible birds sometimes put in an appearance.

Nidification.—The Grey Lag has never yet been actually found breeding within Indian limits, although its breeding-haunts are in part not very far distant. It breeds from Iceland in the west, Scotland in the more northern counties, Norway, Sweden and a great part of Russia, Spain and the northern countries of the Mediterranean, through Trans-Caucasia into Persia and Turkestan. It is a numerous breeder in Trans-Caspia through to Lake Baikal and the Amur. It breeds in Seistan and quite possibly in parts of the Himalayas and in Northern Afghanistan. It has not yet been proved to breed either in Asia Minor or in the Chinese mountains, but almost certainly does so.

There is a small colony of these geese in Algeria, and during the recent campaign in Mesopotamia several observers have recorded seeing goslings in that country, but, as far as I know, no nest was ever seen by anyone.

The breeding-season appears to commence very early in the southern portions of its nesting range. Przewalski records its arrival on its breeding-grounds in Southern Mongolia in the middle of March and that in the valley of the Yellow River young birds were nearly ready to fly in the end of July. In its more northern haunts it will not be found breeding until April, whilst eggs may be taken as late as the first two weeks in May.

As a rule the Grey Lag breeds in company, and many nests may be found in a very small area where the birds are numerous. They are most often placed on small grass- and reed-covered islands in lakes and swamps, or on the shores of the same, either close to or some distance from the water itself. The nest itself is sometimes built amongst, and well screened by, surrounding vegetation, but sometimes, more especially where the birds are not so much persecuted by men, it is placed quite in the open on short grass or even moss, and is then quite visible for a great distance. It is a bulky affair, being as much as, or more than, a foot in height and nearly three times that in diameter at the base. The lining is composed as usual of down from the bird's own breast. At first this is very scanty but as incubation advances more and more, down is added until at last it forms a very thick dense bed, almost covering the eggs as they lie on it. The down is said to be used by the birds for covering over the eggs when the goose leaves them.

The gander is credited with assisting in the piling up of the nest-material and is said to be attentive enough to his wife during the time she is sitting, but he takes no part in incubation and he troubles himself little or not at all about the young after they have hatched, either in regard to their feeding or safety.

The goose is, on the contrary a most excellent mother, and will go through all sorts of contortions and simulation of being wounded in order to decoy intruders away from her young.

Occasionally the Grey Lag builds on the grass-covered banks or

reedy edges of small streams, and in such cases the nest is often all alone. Alphéraky records having found nests of this description on the small streams of the Tian Schan.

The number of eggs laid is anything from four to twelve, and in very rare cases as many as fourteen. The usual clutch is probably six to eight. Incubation lasts twenty-eight days.

Gobel gives the dimensions of fifty-one eggs as follows:—

Average $3\cdot47 \times 2\cdot37$ inches ($= 88\cdot2 \times 60\cdot3$ mm.)

Greatest length $3\cdot75$ inches ($= 95\cdot5$ mm.)

Greatest breadth $2\cdot57$ inches ($= 65\cdot5$ mm.)

Minimum length $3\cdot12$ inches ($= 79\cdot5$ mm.)

Minimum breadth $2\cdot10$ inches ($= 53\cdot5$ mm.)

Taczanowsky gives the measurements of Grey Lags' eggs from Dauria as from $79\cdot6$ to $89\cdot0$ mm. in length and from 58 to 59 mm. in breadth.

The eggs are just like those of the domestic goose. The shell is fairly smooth and satiny to the touch and the texture fine and close and decidedly strong. The colour is a pale cream or buffy-white, occasionally with a very faint greenish tinge in it. The shape is a fairly regular elliptical oval.

The goslings leave their nests very shortly after they are hatched and within twenty-four hours are generally led by their parents to the nearest water.

General Habits.—In Assam, except in the Brahmapootra and the larger rivers, such as the Surma, etc., it goes about in only small parties of some ten or a dozen, but Cripps met with it in Dacca on the Megna in a flock numbering about 200. This was the only time he noticed the Grey Lag in Dacca. As one wanders further west, the flocks become more and more numerous, until in the western Provinces sportsmen speak of flocks numbering their hundreds which run into thousands.

It is a bird of all elevations and is very common in Cashmere in winter, and in other suitable places up to 6,000 feet or more.

“A Member of the Society” states that no geese are found in the Konkan, Deccan, or Khandaish, but he records an *Anser*, by which he must refer to the present species, from Gujarat; here he says that it is not common, but others have obtained them in

great numbers. Hume mentions having found flocks numbering fully 1,200, and, I believe, refers to the flocks he saw in Sind.

They generally arrive in India in October, and do not get far south or east until the end of November ; about Calcutta and further east, they appear to arrive in early and middle December. Of course everywhere they sometimes come in much earlier, and they have been recorded in the north-west in September. In the same way, though they all have left India, as a rule, by the end of March, yet sometimes they stay far later ; for instance, only lately, in the Bombay N. H. S. Journal, Colonel Unwin has reported receiving four "Grey Lag Geese" (*A. anser*) as late as the 2nd of May in Cashmere. It will be interesting, as he says, to see if they do stay and breed ; but I am afraid that there is little chance of it, as their breeding-haunts are not far off, and they are sure to return there. Adams did state that they bred in Ladakh, but his remarks have never been confirmed, and it seems he must have been mistaken.

After Hume's long notes on shooting Geese given in 'Game-Birds' it is very difficult to say anything more of any interest. As every sportsman knows, they are shy, wild birds, and difficult to bring to bag ; but their degree of wildness varies greatly, according to how much the localities in which they reside are shot over. Where many of the natives have guns, and there are also many European sportsmen, the Grey Lag, and every other kind of goose, is an object as worthy of a stalk as any black-buck. In such places, it is little use going out to collect a bag of geese unless one has really made up his mind to work the business out properly. If there are any young crops of wheat, etc., in the district the sportsman should be out before daybreak, and he then may, by a careful crawl through grass and wheat, wet with dew and very cold—it can be cold even in India—get within easy shot of the birds as they feed on the young growth. If wise, he will blaze one barrel into the brown as they feed and get what he can with his second barrel as they rise ; if, however, he is very near indeed, it is better to wait and have both barrels into them on the wing. They take some time getting way on after rising, and give lots of time to put in two shots, and more birds will be dropped in this

way than if the unspread shot had taken them on the ground. Hume also mentions stalking them under a blanket, and beguiling the geese into a belief that you are an inoffensive native just out for a prowl; where, however, the natives have a gun, the geese will undoubtedly "wink the other eye," and, blanket or no blanket, leave long before that article is brought within shooting distance. A bullock is more useful than a blanket under such circumstances, and from behind the shelter of one, much slaughter may be done if the animal is properly worked.

Hume says that they are easily killed during the daytime on all the large rivers. I have not found this to be the case myself, but as his experience is fully ten times what mine is the sportsman had better follow his advice and not mine. He says:—

" During the hotter parts of the day they are, as already mentioned, generally found in larger or smaller parties dozing in the sun on some sandbank at the water's edge. Directly such a party is sighted you take a small boat, and, with the aid of a couple of experienced men, row or punt noiselessly down to within two or three hundred yards of the birds, when, if the water is shallow enough to allow it (and the boatmen seem to know this by instinct), one man gets quietly out of the boat behind, and, while you and your companion in the boat lie down out of sight, he, stooping so as to be entirely concealed by the boat, pushes it down gently and noiselessly, aided by the stream, towards the flock. In this way you may approach, if all is well managed, to within twenty yards of even cranes. You make some arrangement at the bows (I had a false gunwale with suitable holes pierced in it) so as to admit of peeping and shooting without raising your head into view, and, when you get to what you consider the right distance, knock over as many as you can sitting, with the first shot, and as many more as you have time for, before they get out of shot, after they rise. Everything depends on judging rightly the distance for the first shot, with reference to your bore and charge. A little too far you would perhaps hit a score without bagging one; a little too near and you kill one or two outright, and though you perhaps get one or two more as they rise, that is all; but if you have a good heavy duck-gun, say No. 8 bore, with two ounces of A.A., and fire at about 50 yards, you will rarely get less than eight out of a good large flock of geese (and I have got as many as sixteen) with the first shot, besides a brace or so more, with green cartridge, as they rise."

On the Brahmapootra, the only river on which I have made
6

regular attempts to shoot them, I have found them just as wary in the middle of the day as at any other time, and no amount of care or precautions has enabled me to approach within shot, except in exceptional cases. We did, however, sometimes get within shot of them in the early morning, when the mist was still heavy on the water, and the conversational "gag, gag, gag, gag" of the geese was our only guide to their whereabouts, until we got well within shooting distance. Even then it was always necessary to shoot directly the mist rose, or we were near enough to make out their shadowy forms. Rarely, good bags were made by enthusiastic sportsmen who dug holes in the sand, on some sandbank in the line of flight, and having got into these, waited for them an hour or so before dawn.

They are not much of a hand at diving, and give more trouble when wounded by struggling along out of shot. Of course they do dive, and pretty quickly, when hard-pressed, but they cannot stay under water for any length of time, nor do they ever hold on to weeds below the surface of the water, as do many ducks, and so avoid the sportsman. They soon rise after diving, and seldom far from where they entered the water, so that they can be easily shot on appearing. Hume says that he has seen *one* goose taken off by a crocodile; but if he had shot more on the tidal waters on the Bengal side, where the snub-nosed man-eating brute has his abode, I am sure he would have seen many a fat goose and delicate duck disappear down their wide maws. Any big bird not recovered almost as soon as shot is just as likely to form a *mugger's* dinner as it is to form that of the person shooting it. Although bad or rather indifferent divers, they are very good swimmers, and a broken-winged bird gets along the surface of the water with great rapidity. On the wing they are very swift when once started, and are active and graceful as well. They fly, as everyone knows, in the form of a "V", generally one with a very obtuse point, and often with one wing of the "V" more drawn out than the other. They are noisy birds, and their cacklings and cries and trumpets are, on ordinary occasions, far from soul-stirring, but, when on the wing, high up, the loud trumpeting calls are very sonorous and musical. Especially is this the case when, late in the evening, or in the very early dawn, the sportsman, crouched low in some ambush, waits eagerly for the welcome sound that tells

of the approach of his game. To me this form of sport is very fascinating for a few hours, though I admit that it requires great patience, as it is often a long wait between the flocks as they come within reach, and often the temper is tried by the persistent way in which birds continue, one flock after the other, to fly past, either to the right or left, low down, but much too far off to get a shot. When, however, the birds fly kindly, it is very pleasant to hear the constant loud calls, the swish-swish of the wings as they pass, answered by the crack of your 12-bore, and the thud of the fat birds as they kiss mother earth for the last time. Of course, in this way, your bag of geese at all events, won't take many men to carry it, but there is no end to the variety, both of the game killed and the way of killing it. First, perhaps, comes a flight of whistlers in no formation of any sort, and you cover them with your gun, and let them go after you have made sure that you could have dropped a dozen, or if you want food for your men, you do fire and drop a couple. Then a few noisy little cotton-teal fly past in follow-my-leader fashion, each bird anxious to get in front of the others, and each determined that no other shall pass him. Next a flight of mallard, pintail, or gadwall may pass, and the loud, dull smacks on the ground that follow the report of the gun means so many good-eating ducks. As a rule, you will know what you have got by their appearance and flight, but a shoveller will sometimes imitate the gadwall very closely, and the result is disappointing. A flock or two of blue-wing or grey teal may now vary the sport, flying lower but even quicker than the ducks; and, last of all, in the distance, the geese will trumpet forth their approach, and after their arrival flocks of all sorts will pass in increasing numbers until it is too dark to see, and the bag collected, there is nothing left but to go home. In the early morning the routine is reversed, and the geese are the first to be got, and the whistlers and cotton-teal the last.

Geese are almost invariably vegetarians, and get their food by grazing, in which way large flocks will do immense damage to young crops in a single night. They are destructive birds also, owing to the fact that they pull so much of what they feed on up by the roots, and thus destroy what they do not eat.

(13) ANSER ALBIFRONS ALBIFRONS.

THE WHITE-FRONTED GOOSE.

Branta albifrons, *Scop. Ann. I. His. Nat.* p. 69 (1769) (North Italy).

Anser albifrons, *Jerdon, B. of I.* iii, p. 780; *Hume, S. F.* viii, p. 114; *Hume, Cat.* No. 947; *Hume & Marsh. Game-B.* iii, p. 73, pl. 10; *Salvadori, Cat. B. M.* xxvii, p. 92; *Blanford, Avifauna B. I.* iv, p. 417; *Oates, Game-B.* ii, p. 91; *Alphéraky, Geese*, p. 42; *Stuart Baker, J. B. N. H. S.* x, p. 355; *id. Indian Ducks*, p. 70 (1908); *Forbes, J. B. N. H. S.* xviii, p. 683 (1908).

Anser erythropus, *Hume, S. F.* i, p. 259.

Description. Adult Male.—“Forehead and feathers at the base of the upper mandible white; head, neck, back, rump, and wings brownish ash-colour; upper tail-coverts white; breast and belly pale brownish-white, with patches and broad bars of black; sides and flanks ash-brown, with paler edgings, and with a white band on the upper margin; vent and under tail-coverts white; upper wing-coverts greyish-brown with paler edgings, the greater ones edged with white, forming a conspicuous band; wing-primaries bluish-black; secondaries black; tail-feathers dark-grey, tipped with white; bill orange-yellow, the nail white; irides dark-brown; legs, toes, and membranes orange; claws whitish horn-colour. Total length 27 inches, wing 16, tail 6, culmen 1.9, tarsus 2.5.” (*Salvadori*.)

Measurements.—Jerdon gives the wing as 17 inches; on the other hand, Hume gives it as 15 to 15.75.

“Wing 14.75 to 17 inches, culmen 1.57 to 2.20, tarsus 2.25 to 2.30.” (*Alphéraky*.)

Colours of the soft parts.—Hume gives these as follows: Legs and feet bright orange; nails pinky or greyish-white; bill pale livid fleshy; nail whitish or pale yellowish-white; irides pale-brown.

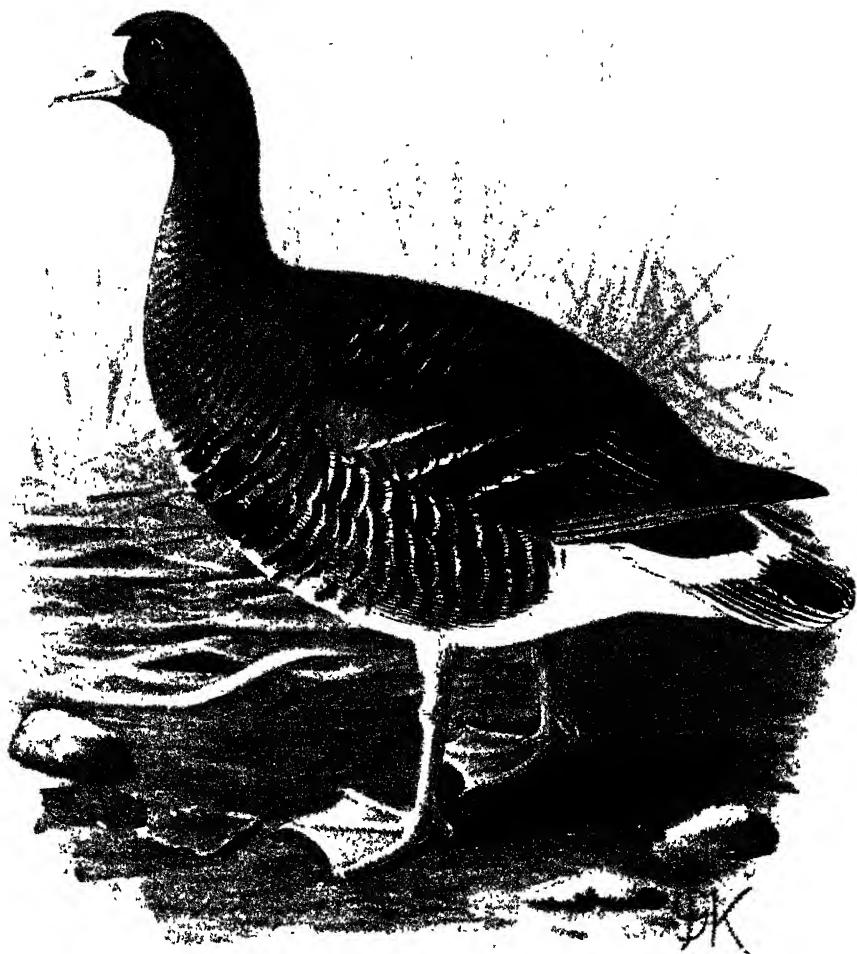
“Bill dull flesh-colour, to a more or less rosy-red, often a very beautiful rosy tint; after death it rapidly turns into orange.” (*Naumann*.)

“Weight: maximum 6 lbs., minimum 4 lbs., average 5.1 lbs.” (*Popham*.)

Female only differs from the male in being rather smaller; I can find no measurements of this goose sexed as females, but Alphéraky remarks:—

“I therefore quote the dimensions of the White-fronted Goose without stating the sex, this being the less to be regretted, seeing that it did not seem possible to give the limits for the maximum measurements of the female, on account of the inadequate material.”

Young.—“Bird of the year is more uniform in colour and rather darker;



THE WHITE-FRONTED GOOSE.

Anser a. albifrons.

$\frac{1}{4}$ nat. size.

the feathers at the base of the upper mandible are rather deeper brown than those of the rest of the head ; the nail and point of the beak light-brown ; the pale-brown feathers of the breast are uniform in colour without any dark patches or bars." (Salvadori.)

As the bird grows older, the white band on the forehead appears and grows wider and wider, and, from what can be gathered from present records, seems to get wider eventually in the adult male than in the female, though Salvadori notes no difference in this respect. As regards the colouration of the under-parts, it varies very greatly, this not according to age apparently. Some birds are so much marked with black underneath that the white is practically absent, only showing through in small patches here and there ; in many the black predominates, whilst in others, the majority, the light colour is much in excess of the dark, in some few there being very little black anywhere. The white on the chin, too, increases with age, and, perhaps to a greater extent, also, on the gander than on the goose.

Young birds in first plumage.—White feathering on head entirely absent, and both on head and along base of upper mandible replaced by brown or brown-black. On light grey belly (where black patches are always wanting) fairly regularly dispersed grey speckles, resulting from the fact that the feathers have grey centres.

Distribution.—*Anser gambeli* is now generally accepted as a distinct species (not by Alphéraky), so that the area inhabited by the Indian bird is considerably curtailed and it does not extend to Japan, though it does to the greater part of China.

Salvadori, however, says that it is true *A. albifrons* which inhabits Greenland, from which place he excludes *A. gambeli*, so that this must now be accepted as one of its breeding-places.

It is also found through the Palaearctic region from Iceland to Siberia, and in the winter from the Mediterranean shores, Egypt, away west through Asia Minor, Persia, and Northern India. Within our limits, comparing it with the way in which the grey lag and the bar-headed goose occur, the White-fronted Goose is a rarity, but a few do come every year to Sind and parts of the Punjab. The Indian specimens in the British Museum come from Lucknow, and the river Jhelum below Shahpur.

Hume says that, during the thirty years he had shot in India, prior to writing 'Game-Birds,' he only once shot this goose ; whether he shot others afterwards I do not know. He records in 'Stray Feathers,' i, p. 259, shooting three geese in Sind, only he then

called them *Anser erythropus*, but gave their dimensions as those of small *A. albifrons*, viz., with wings from 15 to 15·75 inches. It is probable, in fact almost certain, however, that many occur which are not distinguish 1 by sportsmen from other geese, and are thus never recorded.

Lieutenant C. D. Lester records shooting three White-Fronted Geese on the 14th February, 1890, at a place called Deviria near Anjar in Cutch.

Hume, writing of these birds in 'Stray Feathers,' said he twice saw them, once on the Jhelum and once on the Indus; on the first occasion there were three birds, and on the second only two, and they were quite by themselves, not associating with other geese as one would have expected to see.

Captain E. E. Forbes shot one out of a gaggle of five, three or four miles from Cawnpore, on the Ganges, on the 25th January, 1908.

Colonel Graham says that this goose is found in Assam. Oates had the photograph of one sent him which had been shot on the Chindwin river by Captain Williams on the 27th November, 1896, and was also informed by Major Rippon that it had been shot on the lake at Fort Stedman in the Southern Shan States.

It is not a rare bird in Great Britain, but has only twice been recorded from Heligoland in the last century.

Prior to the recent records by Oates, nothing was known of this goose being obtained anywhere to the east of the Indian Empire, though there seems to be no reason why it should not fairly often enter both Assam and Northern Burma. Probably, however, it remains for the western sportsmen to say whether it is comparatively common or not, and it is to be hoped that sportsmen will go in more regularly for making notes of the varieties they shoot and recording them for the benefit of others.

Nidification.—Mr. Pearson ('Ibis,' 1896, p. 221) shot an *Anser albifrons* on July 24th in Novaya Zemblya, and reports that the birds were moulting, so, presumably, they were also breeding there; and according to Alphéraky "they had bred here in large numbers," and "in limited numbers in Finmark." The former author and his brother obtained this goose in the Philippine Islands.

Mr. L. Popham found it breeding on the Yenisei river, but says

that it was not half so common as the bean-goose. He obtained three eggs and also a gosling in down, but gives no details of how he obtained them.

According to Middendorff, who took the nest and eggs of this species in the Taimyr Peninsula on the 10th July, the former was placed in a cone-shaped tussock of grass, plentifully furnished with down from the parent's breast. Again, on August 2nd, he obtained eggs, so that it would appear that it is a late breeder. The Eastern form *gambeli* might possibly straggle into Burma.

Alphéraky, who does not separate *A. gambeli* and *A. albifrons*, describes the eggs as being between $3\cdot48 \times 2\cdot22$ in length and $2\cdot99 \times 1\cdot94$ inches in breadth. A clutch is usually stated as 5, 6 or 7, but there is no doubt that the number is sometimes greater, and I have one of 8 in my own collection.

The eggs do not differ from the eggs of the grey lag, except in being smaller, and, in each case, a decidedly longer, narrower oval. In size they average $3\cdot19 \times 2\cdot12$ inches, exactly the same as twenty-four eggs of Göbel's.

Hartert gives the measurements of eighty-one eggs as follows:—

Average	...	$78\cdot34 \times 53\cdot39$	mm.
Maxima	...	$88\cdot5 \times 56\cdot5$	,, and $85\cdot0 \times 59\cdot0$ mm.
Minima	...	$72\cdot3 \times 51\cdot0$	,, and $75\cdot6 \times 49\cdot2$,,

General Habits.—In parts of its range the White-fronted Goose occurs in immense numbers and in the Kharkov Governments it is said to swarm in tens of thousands.

Alphéraky says that:—

“ White-fronted Geese during their migrations fly, like other geese, in a chain, key, or cone, while sometimes from one side of the angle extends a chain forming a second angle, and in such cases these geese usually fly high. In short flights, they go in a disorderly crowd. Flocks of several thousand, as observed by Mr. A. Brauner on the Dneister, I have never seen, but I often observed 200 or 300 birds in a pack, but more often in gaggles of 70 to 150 or in smaller ones of 40 to 50.

“ In the Don steppes I have flushed swarms of these geese amounting to tens of thousands, but having once risen, these hosts immediately broke up into comparatively small flocks, and flew off, one after another, either to another part of the steppe or to water, uttering all the time their loud, laughing cackle.

Usually the first flight to the steppe took place at dawn, before sunrise ; at eight in the morning they would return to the Muis estuary, whence at eleven to twelve they again flew to the steppe for an hour or two, and about two or three in the afternoon returned to drink and by four o'clock were again on the pasture, where they remained till almost complete darkness. This was the mode of life of the birds if unmolested ; but the flocks, when alarmed, often changed this disposition of their time, and the regularity of their visits to the field were broken. Some authors consider the White-fronted Goose less wary than other geese, while others deny this. Personally, I, after pursuing them with great perseverance, have become convinced that their caution nowise falls short of other geese."

Like all other geese these, at the end of July, moult all their wing quills, and are then flightless, and the Samoyeds take advantage of their comparative helplessness and net them in large numbers, and store them for food during the winter months.

Goslings of the White-fronted Goose are, like all others, expert divers, but adults will not dive unless very hard-driven and then without much skill or endurance.

(14) ANSER ERYTHROPUS.

THE DWARF GOOSE.

Anas erythropus, *Linn. S. N.* 10th ed. p. 123 (1758) (North Sweden).

Anser minutus, *Naum. Vog. Deutsch.* xi, p. 364 (1842); *Hume, S. F.* viii, p. 114; *Hume, Cat. No.* 948.

Anser erythropus, *Jerdon, B. of I.* iii, p. 781; *Hume & Marsh. Game-B.* iii, p. 78, pl. 77; *Salvadori, Cat. B. M.* xxvii, p. 97; *Blanford, Avifauna B. I.* iv, p. 418; *Stuart Baker, J. B. N. H. S.* xi, p. 357; *id. ibid.* xv, p. 524; *Oates, Game-B.* ii, p. 53; *Stuart Baker, Indian Ducks*, p. 73 (1908); *Wignall, J. B. N. H. S.* xx, p. 855 (1911); *Plinston, ibid.* p. 1156; *Thornhill, ibid.* xxv, p. 488 (1918).

Anser finmarchicus, *Gunner. in Knud Leems, Bestrielse*, p. 264 (1767); *Alphéraky, Geese*, p. 59.

Adult Male.—Differs from the last bird, *Anser albifrons*, in being a good deal smaller, and having the white on the forehead far broader, reaching a line drawn across the head between the eyes; also in having a decidedly darker rump and generally darker tint to the plumage, especially on the head and neck.

Measurements.—“Total length about 21 inches, wing 15, tail 4·5, culmen 1·27, tarsus 2·4.” (*Salvadori*.)

“Length 19·5 to 21 inches, wing 13 to 14·1, tail 2·85 to 3·25, tarsus 2·3 to 2·4.” (*Hume*.)

“The Female is yet smaller than the male; wing about 13·3 inches.” (*Salvadori*.)

Colours of the soft parts.—“The colour of the bill is in the young, before the first autumn moult, a reddish-grey, the nail blackish; later this latter becomes a greyish-white, and the bill pale orange-yellow; in old birds the bill is lively reddish-yellow or orange, the nail yellowish-reddish-white. There is never any trace of black upon the bill.

“The naked edges of the eyelids are dirty yellow in the young, orange in the old; the irides are dark-brown. The feet are in the young a pale dirty yellow tending towards orange; in the old a lively orange-yellow or almost orange-red. The claws are pale brown-colour, darker brown towards the tips.” (*Naumann*.)

In the bird sent to me by Mr. Johnston, and recorded later on in this article, the feet were bright chrome-yellow, and the bill livid-green with the nail paler. These colours were recorded after the bird had been dead about

eight hours. Mr. Finn records from three live birds before him, that of the soft parts "the bill is of a beautiful rose-pink, not orange the eyelids are lemon-yellow. In its dark eyes and orange feet, &c." All three of these birds had the soft parts similarly coloured. According to Alphéraky :—

"In the Lesser White-fronted Goose the yellow colouring and slightly swollen state of the cerea are extremely characteristic. These swollen eyelids appearing so early (in the first plumage) are of a lemon-yellow colour, forming a complete ring round the eye, which, as we have already seen, is never the case with the White-fronted Goose."

Young.—Are less marked with black on the lower parts, often not at all and the white on the forehead is absent. This seems to appear first in the spring of the first year, and increases gradually with age, probably not reaching its full width until about the third year.

Distribution.—This little goose is found over the greater part of Northern Europe, to the west as far as Great Britain (but only on rare occasions), in Lapland and eastwards, through Siberia and Northern China. In the cold weather, it is found in Western Europe, Turkey, Asia Minor, North Egypt, Persia, Afghanistan, Northern India, China and Japan.

In India it has been but rarely recorded, and I can find few notes of its occurrence since the publication of 'Game-Birds.' Blanford, in 'Eastern Persia,' ii., p. 303, records *Anser erythropus* from Persia, and in a footnote he says :—

"One goose at least is very common in Persia. Many couple remain to breed in the reeds round the lake Dashtiarjan and the marshes near Shiraz, whence goslings are often brought into the town. I have never seen them in mature plumage, nor been able to shoot an old bird, so cannot say to what species they belong."

I was told by a correspondent in Cashmere that he had shot four geese there in 1901 which were of this species. Mr. H. E. James, in the lecture, part of which was given in No. 2, Vol. viii, Bombay N.H.S. Journal, says : "A friend, of Sukkur, last year shot the very rare *Anser erythropus*, the White-fronted Goose, and ate it." I conclude that *Anser erythropus* is correctly given, and that it is only the trivial name which is not the one by which we generally know the Dwarf Goose.

I am afraid a very large number of birds which should be skinned and preserved, are plucked and eaten. Some dozen years

ago, a friend of mine, who knew how very keen I was on ornithology, informed me with great glee that he had been having a feed on some "hill ptarmigan." He described a bird of that family most minutely, and I thought he must have got hold of something really good, and offered fabulous prices to any Naga who would produce some of these birds for my inspection. Of course they never came, but eventually my friend, seeing me handling some imperial pigeons, suddenly exclaimed: "Why, there are the hill ptarmigan!" I regret to say that his description, as given me, contained only two points which referred to the pigeon, *i.e.*, their colour and their feathered toes, the rest was the result of a fertile imagination, a desire to please, and the knowledge, he being a good sportsman, of what a hill ptarmigan *should* look like.

The same man ate with relish some fine specimens of the Naga hill-partridge (*Arboricola rufigularis*), and left me the wings and a few feathers to weep over. However, partridges and ptarmigan are not geese, and I must stray no further.

The other recorded Indian specimens are: two shot and one other seen by Captain Irby in Oudh; others seen. Some, Hume does not say how many, were obtained by Mr. A. Anderson near Hurdui in Oudh, and at Futtepur in the North-west Provinces. One procured by Dr. Bonavia near Lucknow; and three shot by Mr. Chill, some thirty miles south of Delhi. Three were obtained by Mr. Frank Finn (a male and two females), from a bird-dealer in the provision-bazaar in Calcutta, said to have come from somewhere near Rawal-Pindi. One was shot by Mr. R. Johnston, at Sookerating, Lakhimpur, Assam, in October, 1903. One recorded from near Nowshera by Mr. J. Wignall, shot on the Kabul river on the 23rd October, 1910. Finally, Mr. Plinston records seeing four and shooting one on the Gogra, near Fyzabad, on the 23rd February, 1911.

Nidification.—This little goose breeds in Lapland and (*vide* Alphéraky) "it breeds in the Kaninck Peninsula, and probably throughout the whole tundra of the northern coast-line of Siberia." Its breeding-grounds in Lapland are close to the perpetual ice, yet, in spite of this, it is a comparatively early breeder, as Middendorff took the young in down as early as the 23rd June,

and on the 29th July a young bird in which the quill-feathers had started growing.

It lays five to eight eggs, in the usual goose's nest, which are generally described as of a dull creamy-white in colour, of a broad regular oval shape, glossless texture, and measuring about $2\cdot9 \times 2$ inches. Eggs in my own possession are dull-grey, one with the creamy tint very slightly developed. They are very long ovals, measuring $2\cdot85 \times 1\cdot84$ inches, and are perhaps rather abnormal in shape.

The eggs in the British Museum vary between $3\cdot27$ and $2\cdot70$ inches in length, and between $1\cdot93$ and $1\cdot80$ in breadth.

(15) ANSER BRACHYRHYNCHUS.

THE PINK-FOOTED GOOSE.

Anser brachyrhynchus, *Baillon, Mem. Soc. Abb.* p. 74 (1833) (Abbéville); *Hume, S. F.* viii, p. 114; *Hume, Cat.* No. 946; *Hume & Marsh. Game-B.* iii, p. 71; *McLeod, S. F.* x, p. 168; *Salvadori, Cat. B. M.* xxvii, p. 103; *Blanford, Avifauna B. I.* iv, p. 418; *Outes, Game-B.* ii, p. 65; *Stuart Baker, J. B. N. H. S.* xi, p. 399: *id. ibid, Indian Ducks*, p. 76 (1908).

Melanonyx brachyrhynchus, *Alphéraky, Geese*, p. 87.

Adult Male.—“Whole head and neck brown with chocolate or coffee tinge, and often with a small number of white plumules at the base of the bill. Upper part of the back, between scapulæ, brown with rufous tinge. Lower part of back and scapulars light-brown, the feathers becoming rufous towards tips and edged with light-rufous or light-grey. Rump slate-brown; upper and lower tail-coverts pure white. Tail blackish-brown, with white edgings and tips to the feathers. Upper wing-coverts slaty ashen-grey, and edged (more or less widely) with light rufous. Tips of median and greater wing-coverts very pale grey-rufous. Outer primaries grey, with black tips; inner primaries and secondaries uniformly brown-black, latter with narrow whitish margins; tertaries dark-brown with wider whitish edgings. Whole breast rufous-brown, with pale edgings to feathers, producing a barred wavy effect. Flanks rufous-brown, each feather at tip passing gradually into rufous and fringed with lighter, sometimes greyish margins.

“Remaining part of under surface of body dingy-white, upper part of belly with darker grey transverse striping.” (*Alphéraky.*)

Colours of soft parts.—Legs and feet deep rosy-red, claws black, irides brown. Bill a beautiful carmine-pink, nail black, the base of the bill is also black to a greater or less extent; in young birds the pink exists only as a narrow band behind the nail, in old birds it extends back to the nostrils, along the culmen only as far as the upper edge of the nares, and on the lower edge, sometimes, as far back as the extreme base of the bill.

Measurements.—The measurements of a very fine male in my possession were: length 27 inches, wing 16'8, tarsus 2'44, tail 4'8, bill at front 1'6, and from gape 1'65. Wing 15'7 inches, culmen 1'73 to 1'88, depth of bill at base 2'22, tarsus 2'20, weight 6½ to 7½ lbs.” (*Alphéraky.*)

Distribution.—Salvadori says regarding the distribution of this goose :—

“ Spitzbergen, where it nests, and probably also Franz Joseph Land: during the migration and in winter in North-west Europe; occasionally it strays to Germany, Belgium and France; its alleged occurrence in India requires further evidence.”

In spite of Salvadori’s doubt on the subject, this beautiful goose has now been ascertained beyond question to visit India. As long ago as 1849 Blyth recorded it from the Punjab, and mentioned it in the ‘ Catalogue of Birds of the Asiatic Museum.’ Thirty years then elapsed before there occurred any further notice of this goose in Indian publications, and then Hume again noted its occurrence (in ‘ Stray Feathers,’ viii). In 1864 he had, however, shot two birds of this species in the Jumna, and Colonel Irby also had recorded having seen a specimen killed near Lucknow in January, 1858. Colonel Graham assured Mr. Hume that the species is not uncommon in Assam on the Brahmapootra.

Again, Major-General McLeod says of this goose :—

“ I shot one of these out of a flock of about twenty on the Kunawan bheel, near Gurdaspur, Punjab, in 1853.”

All these records *may*, however, have referred to other species of bean-geese, most probably to *neglectus*, a goose far more likely to favour us with visits than is *brachyrhynchus*, whose range does not *normally*, extend nearly as far as India.

The Goose in my collection, above referred to, was shot by one of my collectors on a large bheel in the south of Cachar. He said that it was one of a flock of about a dozen, and that they were extremely wary and wild. He went after them several times without obtaining a shot, and at last got it by a fluke. He was stalking some ducks when these Geese, which had been put up by someone else, flew close over his head, and a lucky shot aimed at the front bird knocked over one of the last ones.

This is the bird referred to by Oates in his article on the bean-geese which appeared in the Bombay N.H. Society’s Journal, and which he also mentions in his manual of ‘ Game-Birds.’ Since these were written I have, in consequence, hunted up, and luckily found my original notes on the Goose, which leave absolutely no doubt as

to my identification having been correct, the notes on the wing-colouration and the bill having been very full.

Seebohm, 'Birds of the Japanese Empire,' pp. 236-237, says:—

"The Pink-Footed Goose was admitted to the Japanese fauna on the authority of a female obtained in October at Hakodadi by Captain Blakiston (Swinhoe, 'Ibis,' 1875, p. 456). Unfortunately this example cannot be found, and some doubt attaches to the correctness of the identification."

He goes on to say:—

"It is possible that this may be an example of a Pink-Footed Goose, but in the absence of the black base to the bill I am inclined to regard it as the young in first plumage of the White-Fronted Goose."

I may note that the bill of the specimen in my collection, which has had very rough usage from neglect, rats, and, finally, earthquakes and heavy rain, is now of a uniform dirty grey-white, the whole of the outer portions having been pounded off by the heavy stones of a wall falling on it during the earthquake of 1897. It would seem, therefore, that very little reliance can be placed on the colouring of the bill in old specimens as a means to identification.

Nidification.—As regards the breeding-habits, there seems to be little on record beyond Dresser's notes; he says:—

"Of its breeding-habits but little, comparatively speaking, is known, and it is only known to breed with certainty in Iceland and Spitzbergen. Professor Malmgren, who obtained its eggs in the latter island, says that it is exceedingly wary and shy. In the early summer it is to be seen in small flocks on moss-covered low lands near the sea, or on rocky precipices, where there is vegetation here and there; but in the breeding-season it is seen in pairs. When moulting, it frequents fresh-water swamps, and later on, when collected in flocks, it is to be met with near the cost.

"Its nest is placed in prominent situations on high rocks, or platforms on steep cliffs, often close to a river, or in some grass-covered place, and sometimes on high cliffs close to the sea on the inner fjords. The nest is so situated that the birds can have uninterrupted views from it of the country round, and can readily see if an intruder approaches or danger threatens. Hence it is difficult to shoot this shy bird, even at its nest, for the gander is extremely watchful, and directly anyone approaches warns his mate by uttering a clear whistling cry. In June the female lays four or five eggs

which are hatched about the 10th or 15th July, and both parents assist in taking care of the young. I possess a single egg of this goose, obtained on the Swedish expedition to Spitzbergen, which is pure white, resembles the egg of *Anser anser*, but is rather smaller, and the grain of the shell is somewhat smoother."

Morris, 'Nests and Eggs of British Birds,' says:—

"These birds unite about the middle of May; Mr. G. Macgillivray has remarked that he saw them in pairs about the middle of the month, and that they had the young fully fledged and strong upon the wing about the end of July. They had again collected into flocks by the beginning of August. The eggs are of a pure white colour. Eight were laid by one of these geese kept in the water in St. James' Park by the Ornithological Society of London."

I have received several clutches of this fine goose's eggs from Iceland, two of five each, and two of four each, and from Spitzbergen I have received a single egg. They are in no way different from the eggs of the grey lag goose, but average considerably smaller, the nineteen being, on an average, only 3·0 by 1·98 inches, and the largest only 3·15 by 2·06.

(16) ANSER NEGLECTUS.

SUSHKIN'S GOOSE.

Ansér neglectus, *Sushkin*, *Bull. B. O. C.* v, p. 6 (1895) (East Russia), *Oates*, *Game-B.* ii, p. 75; *id. J. B. N. H. S.* xvii, p. 44; *Stuart Baker*, *ibid.* p. 537; *Alphéraky*, *ibid.* p. 599; *Buturlin*, *ibid.* p. 604; *Oates*, *ibid.* p. 900; *Stuart Baker*, *Indian Ducks*, p. 80 (1908).

Melanonyx neglectus, *Alphéraky*, *Geese*, p. 78.

Description.—“The species is distinguished from *A. brachyrhynchus* by greater size, larger and more robust bill, and by the fact that the secondary coverts are black-brown, and thus of another colour to the main coverts. From *A. segetum* it is distinguished by the dark flesh-colour of the legs and median part of the bill.

“As concerns the colour-differences of the plumage of the new goose from *A. segetum*, the colouring of the head and neck is darker than in the latter, and the margins of the feathers of the upper side and of the dark feathers of the sides of the body are browner. In some specimens, just as in *A. segetum*, is observable a slight admixture of white feathers at the very root of the upper mandible.” (*Sushkin*.)

To this description *Alphéraky* adds:—

“The bill of Sushkin's Goose is comparatively weak and narrow; from the bill of *M. segetum* it is distinguished by its far less depth at the base, and in particular by the feebler lower mandible. . . A still more marked difference is presented by the shape and comparative size of the nail on the upper mandible.”

The last sentence refers to the difference as shown in my key. The differences between *neglectus* and *segetum* are the same, emphasized, between *neglectus* and *serrirostris*.

Total length about 30 inches, wing 17·7 to 19, culmen 2·16 to 2·48, tarsus 2·95 to 3·11.

Bill: nail black, base of bill black as far as the exterior edge of the nostrils, but with the edge uneven and receding slightly in the centre; band of bill a lovely carmine-pink; feet vivid fleshy-red. (Notes by Mr. Mundy).

Bill with black nail and base and bright pink centre; feet same as the light portion of the bill. (Notes by Dr. Moore).

Young in first plumage.—“These differ from the adults first of all by the narrower feathers of the body, as is generally the case with all young geese compared with old. Tips of the feathers on neck light whitish-

grey. Underparts light dingy-grey, with tinge of ochreous and darker rounded grey centres to feathers; vent and tail-coverts (upper and lower) dingy-white, perhaps due to dustiness of skin. Head and neck brown, with strong coffee tint." (*Alphéraky.*)

Distribution.—The extent of the range of this goose has not yet been definitely settled: it *probably* occurs in Great Britain; it *certainly* occurs in Hungary, Russia, and much of Central Europe, Asia Minor, and the extreme west of Asia through to Persia. Seebohm obtained it on the Yenesei, and three birds obtained by Dr. Moore and my men in Dibrugarh were of this species.

In vol. xvii of the Bombay N.H.S. Journal, when writing of this species (p. 537), I most unfortunately twice wrote *middendorffi* instead of *neglectus*, the former of these two, of course, not being a pink-billed species. In consequence of the discussion on bean geese which arose in the Journal, I hunted up my old notes on this subject, and was lucky enough to find letters from Messrs. Moore and Mundy, and also my own notes. These, I think, quite definitely fix the identification of the geese obtained.

Nidification.—Sushkin's Goose breeds in Novaya Zemlya, and almost certainly in Kolguev, perhaps also in the Surgai district near Urkach.

(17) ANSER FABALIS SIBIRICUS.

MIDDENDORFF'S GOOSE.

Melanonyx arvensis sibiricus, *Alphéraky*, *Geese*, p. 104 (1905) (Taimyr).

Anser middendorffii, *Severtz.* *Turkes. Jevotn.* p. 70 (1873); *Oates*, *J. B. N. H. S.* xvii, p. 45; *Alphéraky*, *ibid.* p. 599; *Buturlin*, *ibid.* p. 604; *id. Field*, Nov. 17, 1906; *Oates*, *Game-B.* ii, p. 76; *Stuart Baker*, *Indian Ducks*, p. 82 (1908).

Anser serrirostris middendorffii, *Salvadori*, *Cat. B. M.* xxvii, p. 102.

Anser fabalis sibiricus, *Hartert*, *Vog. Pal.* p. 1286 (1920).

Description. Adult Male.—“Head and neck grey-brown for the most part, with a strong rufous, coffee, or grey-bay tint. A male from Amurland has even a golden-buff colour on the head and neck, and apparently such examples are far from being of rare occurrence locally in East Siberia, as indicated by the name, ‘Yellow-Headed Goose,’ met with among native appellations in Transbaikalia. All these various tints are evidently of accidental origin, and are just as often present in different individuals as absent. They are doubtless caused by the same factors as the rusty or yellow tinges on the heads of swans, ducks, and other species of geese.

“In the rest of the plumage, except for a more uniform dark-brown colouring on the upper surface of the body, the eastern form does not differ from the typical. Even in dimensions, with the exception, of course, of the bill and feet, *M. arvensis sibiricus* almost agrees with large examples of *M. arvensis*. (Alphéraky.)

Bill black, with a ring of yellow-orange round the apical portion of both mandibles behind the nail. In most cases this is quite narrow, though it may be found to extend as far back as the anterior edge of the nostril in a few specimens, but never, as in *A. fabalis fabalis*, back to the edge of the forehead.

Alphéraky gives the length of the culmen as never being less than 2'91 inches in adults, and extending to as much as 3'26; and Buturlin gives the smallest measurement he has found in this bird as 2'87, and in the same place says that he has found specimens of *fabalis* with culmen exceeding 2'75 inches.

Middendorff's Goose is the Eastern form of *fabalis*, the Bean-Goose and only differs from that bird, except as noted above, in having a larger bill and in having less yellow on it.

Distribution.—As regards its distribution, Alphéraky gives it as follows:—

“ Everywhere in East Siberia from the Taimyr Peninsula Eastwards to Kamchatka, Chukchiland, and the Komandor Islands. . . . It nests on the Boganida, on the lower reaches of the Yana, on the Vilyui in the Yakut Government, and almost everywhere throughout Siberia between Lake Baikal and the Sea of Japan, near great rivers and lakes southwards to 50 degrees N. lat. and possibly still farther South.

“ It migrates to pass the winter in China and Japan, but how far it descends southwards for this purpose we have no idea.”

Nidification.—In reference to its breeding, he writes:—

“ This Goose breeds alike in the lowlands and on the hills;” and quotes Maak to the effect:—

“ It builds its nest near the Vilyui and its tributaries, on lakes far removed from habitations, and young in down were found as early as June 8th.”

The eggs are described as being almost white or yellowish, but as soon becoming much soiled with incubation. In length they vary between 2·89 and 3·68 inches, and in breadth between 2·09 and 3·44; the smallest measurements are probably abnormal, the next smallest measuring 3·07 to 2·11 inches.

General Habits.—According to Radde this goose arrives on the Tarei-Nor at the same time as the grey lag, at the end of March; on the Irkut it did not arrive until May.

Its voice is said to be similar to that of *Anser f. fabalis*, but hoarser. It moults at the same time of the year as the latter, and like that goose is taken in great numbers by the fowlers for food. It is said by these fowlers to be an excellent diver, a talent that adds greatly to the difficulty of catching it.



THE BAR-HEADED GOOSE.
Anser indicus.

(18) ANSER INDICUS.

THE BAR-HEADED GOOSE.

Anas indica, *Lath. Ind. Orn.* ii, p. 839 (1790).

Anser indicus, *Jerdon, B. of I.* iii, p. 782; *Hume, Nests and Eggs*, p. 636; *Butler, S. F.* iv, pp. 27, 40 and 99; *id. ibid.* vi, p. 260, *Adams, ibid.* p. 401; *Hume, ibid.* vii, p. 491; *Hume & Marsh. Game-B.* iii, p. 81; *Hume, Nests and Eggs* (Oates' ed.), iii, p. 279; *Oates, Game-B.* ii, p. 57; *Salvadori, Cat. B. M.* xxvii, p. 105; *Stuart Baker, J. B. N. H. S.* xi, p. 362; *id. ibid., Indian Ducks*, p. 84 (1908); *Hopwood, J. B. N. H. S.* xviii, p. 433 (1908); *Harington, ibid.* xix, p. 312 (1909); *Bailey, ibid.* p. 367 (1902); *Perreau, ibid.* p. 901 (1910); *Whitehead, ibid.* xx, p. 980 (1911); *id. ibid.* xxi, p. 158 (1911); *Bailey, ibid.* p. 181; *Harington, ibid.* p. 1088 (1912); *Osmaston, ibid.* xxii, p. 548 (1913); *Currie, ibid.* xxiv, p. 576 (1916); *Inglis, ibid.* p. 600; *Whistler, ibid.* xxvi, p. 190 (1918).

Eulabeia indicus, *Ball, S. F.* iii, p. 436.

Eulabeia indica, *Alphéraky, Geese*, p. 133.

Adult.—“ Head white, with two horse-shoe blackish bars on the occiput and nape; hind neck brown-black; a longitudinal white band on the sides of the neck; upper plumage very pale-ashy, the feathers edged with whitish and tinged with brown on the mantle and scapulars; sides of the rump and upper tail-coverts whitish; throat white, fore-neck brownish-ashy, passing gradually into cinereous on the breast, whitish on the abdomen; vent and under tail-coverts white; feathers of the flanks brown, rufous towards the tips with pale edgings; quills grey, dusky towards the tips, and gradually becoming darker towards the secondaries; tertials brownish-grey; tail grey, white-tipped.

“ Total length 27 inches, wing 17, tail 6, bill 2, tarsus 2·75.” (*Salvadori.*)

“ Length 27·25 to 33·5 inches, expanse 50 to 60, wing 16·0 to 19·0, tail from vent 5·0 to 7·0, tarsus 2·5 to 3·3, bill from gape 1·8 to 2·3. Weight 4 lbs. to 6 lbs. 14 ozs.” (*Hume.*)

“ The legs and feet are light orange, sometimes paler, occasionally only yellow; claws horny-black; the irides deep-brown; the bill orange-yellow to orange, rarely only pale lemon-yellow, often paler or greenish towards the nostril: the nail black or blackish.” (*Hume.*)

Young.—“ Forehead brownish-white, a little tinged with rusty; a dusky

line through the lores to the eye ; whole crown, occiput, and nape sooty or dusky-black ; no trace either of the two distinct black head-bars or of the conspicuous white neck-streaks ; back of neck wood-brown, sides and front of the lower part of the neck pale dusky-greyish, mottled with whitish ; most of feathers of the breast and abdomen have a pale rusty tinge towards the tips ; the conspicuous dark banding of the flanks of the adults is almost entirely wanting ; tail somewhat browner than in the adult." (*Salvadori.*)

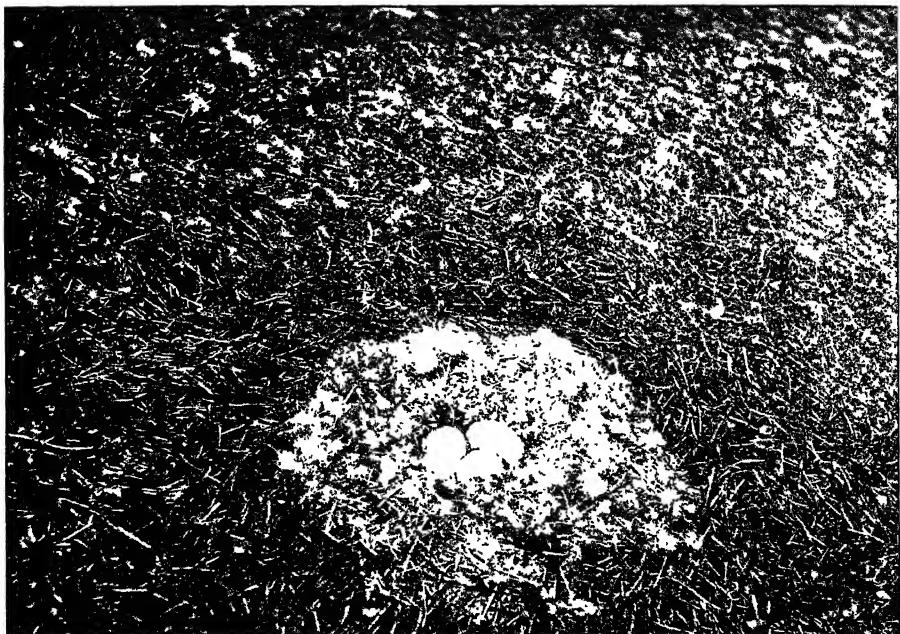
Young in Down.—" Pale yellowish, top of the head and upper parts pale-brown." (*Salvadori.*)

Distribution.—Roughly speaking, the habitat of this goose is India and Northern Burma and the Shan States during winter, and in summer Central Asia due north of these countries, up to latitude 55° N.

The most southern record which I can find is that by Jerdon in his 'Birds of India.' He writes :—

" I once saw a couple of these geese in the extreme south of India in August, in a small sequestered tank. This pair may have been breeding there, but perhaps they were wounded or sickly birds."

It is quite possible that they were breeding, but it is almost certain that one at least of the pair must have been damaged in some way sufficiently to incapacitate it from migrating. They are very devoted to one another, and probably if either of a pair of geese were injured, the other would remain with it. On the other hand, they might both have been geese, or both ganders, in which case, also, of course, both must have been injured. In Southern India it is nowhere a common bird. Major McInroy reported it as common in the Chitaldroog district of Mysore, and Mr. Theobald as not common in Coimbatore. In the south of the Central Provinces it is still far from plentiful. In Bengal it is met with in considerable numbers on all the larger rivers quite down to their mouths. I have seen great flocks of them, both in Jessore and Khulna, in January. It is also found on the rivers running through Behar, Chota-Nagpur, etc., but is not common. In Assam it is comparatively rare, but has been met with in Sylhet, Cachar, and Manipur, and I have also seen it in Kamrup, and it extends all up the Brahmapootra. It is to the west of Bengal, however, that it is found in such vast numbers, and in most parts there outnumbers all the other geese by more than five to



NEST OF BAR-HEADED GOOSE.



TIBETANS COLLECTING EGGS OF BAR-HEADED GEESE.

one. In Sind, however, the grey lag is the more common, and it has not been obtained in Gujarat.

Nidification.—Its headquarters for breeding seems to be the numerous lakes in Ladakh, and it also breeds throughout Tibet in suitable localities, and probably also north of the Himalayas in many other parts.

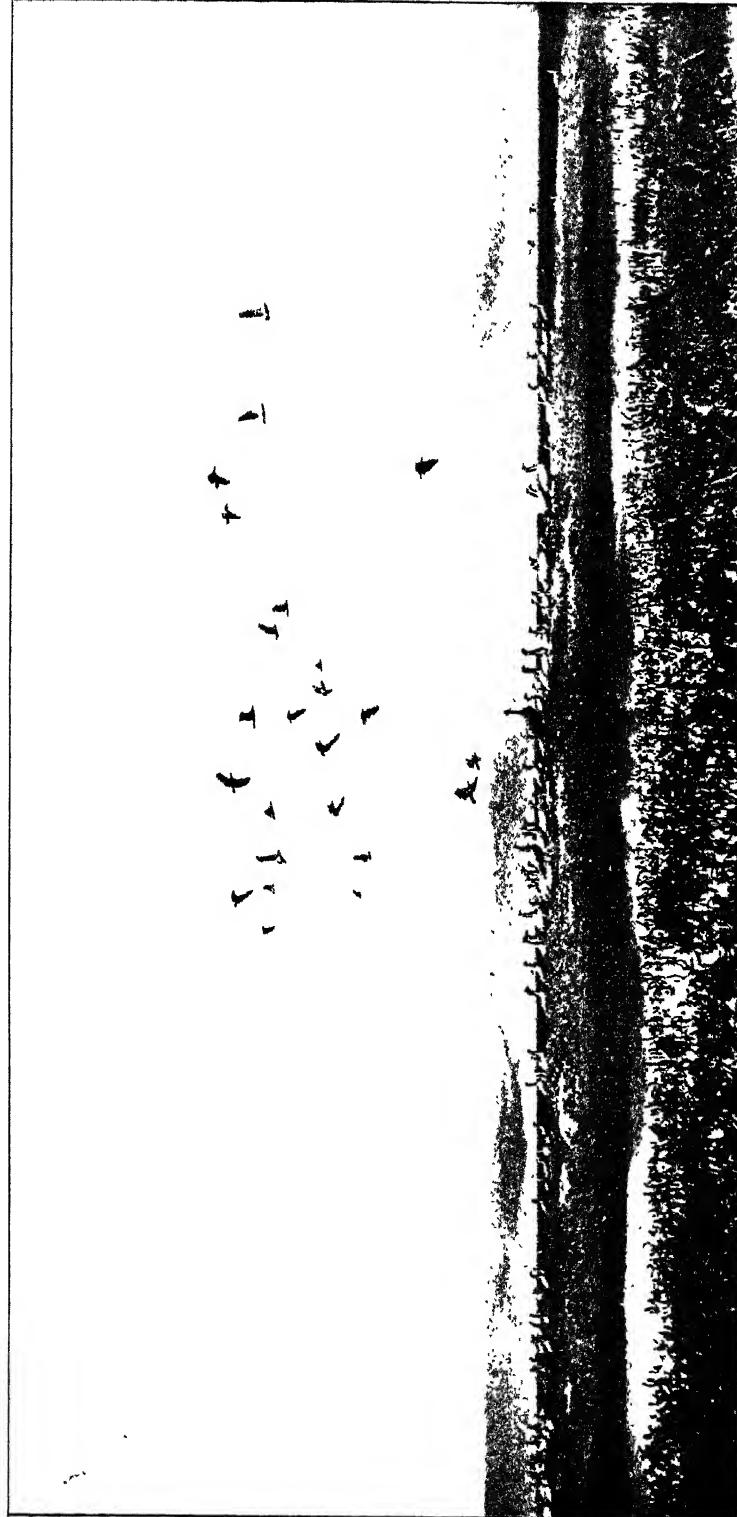
Drew, writing of one of the many islands in the Tsomourari lake in Ladakhi, says:—

“The island is about half a mile from the shore, nearly midway in the length of the western side—it may be 100 yards corner to corner in one direction and 60 yards in another; it is of gneiss rock, rising only 9 or 10 feet above the water; the soundings before given show that there is about 100 feet of water between the island and the near shore. This little place, being ordinarily undisturbed by man, is a great resort of the gull, which in Ladakhi is called Chagaratse; the surface was nearly all covered with its droppings, and there were hundreds of the young about; most of these must have been hatched near the beginning of July. Having heard that it was a matter of interest with some ornithologists to learn about the nidification of the wild (barred-headed) goose, I was on the look-out for information concerning it, and I found that this island is one of the places where it lays its eggs. I was told by the Chámpás that they find the eggs there just before the ice breaks up—say, the beginning of May; after that they have no means of reaching the island. I myself found there a broken egg, but at the time I was on the island (the last week in July) the young had all been hatched. A few days later I followed the same enquiry in the Valley of the Salt Lake, and on an earthy island in the fresh-water lake called Panbuk I found a nest where the mother was sitting with some goslings and two eggs, one just breaking with the chick; the other egg I measured, and found it to be $3\frac{1}{4} \times 2\frac{1}{4}$ inches, and very nearly elliptical in form. The nest was a slight hollow, lined with first a few bits of soft herb, then with feathers. I was told that these goose-eggs are found also at the edge of the Salt Lake itself.”

Two beautiful photos of these geese in their breeding-haunts and a most interesting account of their nesting is given by Major F. M. Bailey in the Bombay Natural History Society’s Journal. These plates, with two others kindly sent me by Major Bailey, are here reproduced, and show very well both the nature of the ground on which the birds breed and the nests themselves.

His description is as follows:—

"On the 2nd June, 1908, on my way down from Gyantse to Phari, I left the main road, which skirts the Northern shore of the Hramtso—a lake 14,700 feet above sea level, and some eight miles long by four broad—and travelled round the southern side, halting for two days at the village of Hram. The southern shore of this lake is bordered by a belt of marsh about two miles broad in its widest parts. On this marsh thousands of Bar-Headed Geese breed, and it was the hope of being able to visit their nests that brought me here. The villagers of Hram annually collect hundreds of these eggs, and sell them at the rate of thirty for a rupee to men who carry them to different parts of Tibet for sale. This year, however, for religious reasons, the killing of all game and the taking of the eggs of wild birds has been prohibited by the Lhasa Government, and so I was fortunate in finding the birds more or less undisturbed. On arriving at the village I sent for some men who could show me where the nests were, and we walked the mile between the village and the edge of the lake, carrying with us a flat-bottomed Tibetan skin-boat. This we launched at the edge of the lake, and I was pushed across a few hundred yards of clear water which was only about two feet deep. Here we were on the marsh and could see dry islands ahead of us, white with thousands of geese. The nearest of these islands was about a quarter of a mile away, but we were at least a quarter of an hour covering this distance. Every step one sank in up to the thighs in mud, and at that elevation frequent rests were necessary. I was told that we were having luck in crossing the marsh, as, if the wind had been blowing from the north, that is, from the deeper part of the lake towards the marsh, the water would have been banked up on the marsh and it would have been too deep to be passable. As we neared the first island, my guides pointed out the tracks of men over the marsh, who, they told me, must have come by night, disobeying the orders from Lhasa regarding the taking of eggs this year; but I suspect that my guides themselves had taken a few eggs for their own consumption, as a stranger would be sure to get lost, the marsh being impassable in many places. At last we reached the first nests. They were situated on a grassy island about two feet higher than the marsh. This island was circular and about twenty yards in diameter and contained fifteen nests. The nest consists of a slight hollow in the grass plentifully lined with down which is banked up round it. The nests contain from two to eight eggs, the commonest number being four, and the number of birds in the broods that are seen all along the roadside on the Northern shore of the lake is almost invariably four. I am inclined to think that when there are more than four eggs in a nest, some are bad ones which were laid possibly by another bird, as some of the eggs in a nest containing more than four eggs are always very discoloured



RHAMTSO LAKE WITH NESTS OF BAR-HEADED GOOSE AND BLACK-NECKED CRANE.

and evidently much older than others and might perhaps have been laid the previous year. I noticed this in one case in which birds were just being hatched from the fresher looking eggs. These birds seem to lay their eggs in a very promiscuous manner, for I saw many single eggs laid on the grass outside the nests. The Tibetan collectors only take quite fresh eggs, which can at once be known by their clean appearance, as the eggs become soiled with mud from the sitting parent very soon after they are laid. As soon as the eggs are hatched, the birds leave the marsh, and move across to the open water, and are seen in great numbers on the Northern shore of the lake; and except the very freshly hatched birds, I saw no young ones on the marsh. This lake is frozen over in winter, but at the beginning of March, as soon as some clear pools are melted, a few geese and duck may be seen, and birds remain there until the lake freezes in November. A young bird shot in the beginning of winter has no bars on the head. The broad black line which in an old bird runs down the back of the neck below the bars is continued on to the forehead, but is not quite so dark on the young bird as it is on the old one. Apparently, the only protection which the birds have, is the impassability of the ground between their nests and the shore, as no attempt at concealment of the nests is made. I saw a number of eagles on the marsh, but I think most of them were fish eagles.

"The Tibetan name for the bar-headed goose is 'Angba Karpo' or more briefly 'Ang Kar' which means 'white goose.' The Brahminy Duck, which nests in ruined houses and rocks near the lake, is called the 'yellow goose.' I made careful enquiries from the egg collectors as to the presence of any other kind of goose on the lake, and they assured me that the bar-headed goose was the only kind, and I have never seen any other species at any time of the year.

"After taking as many eggs as I wanted I returned, but sent some men on to see if they could get the eggs of *Grus nigricollis*, of which many were feeding on the marsh, and in the evening they brought me one egg and a clutch of tern's eggs. The brown-headed gull (*Larus brunneicephalus*) was also seen in large numbers, and one egg was brought to me subsequently.

"The photographs show the individual nests, which appear as white patches, and also the down scattered all over the nesting ground. They also show how the nests are crowded together, the distance between them being frequently less than a yard."

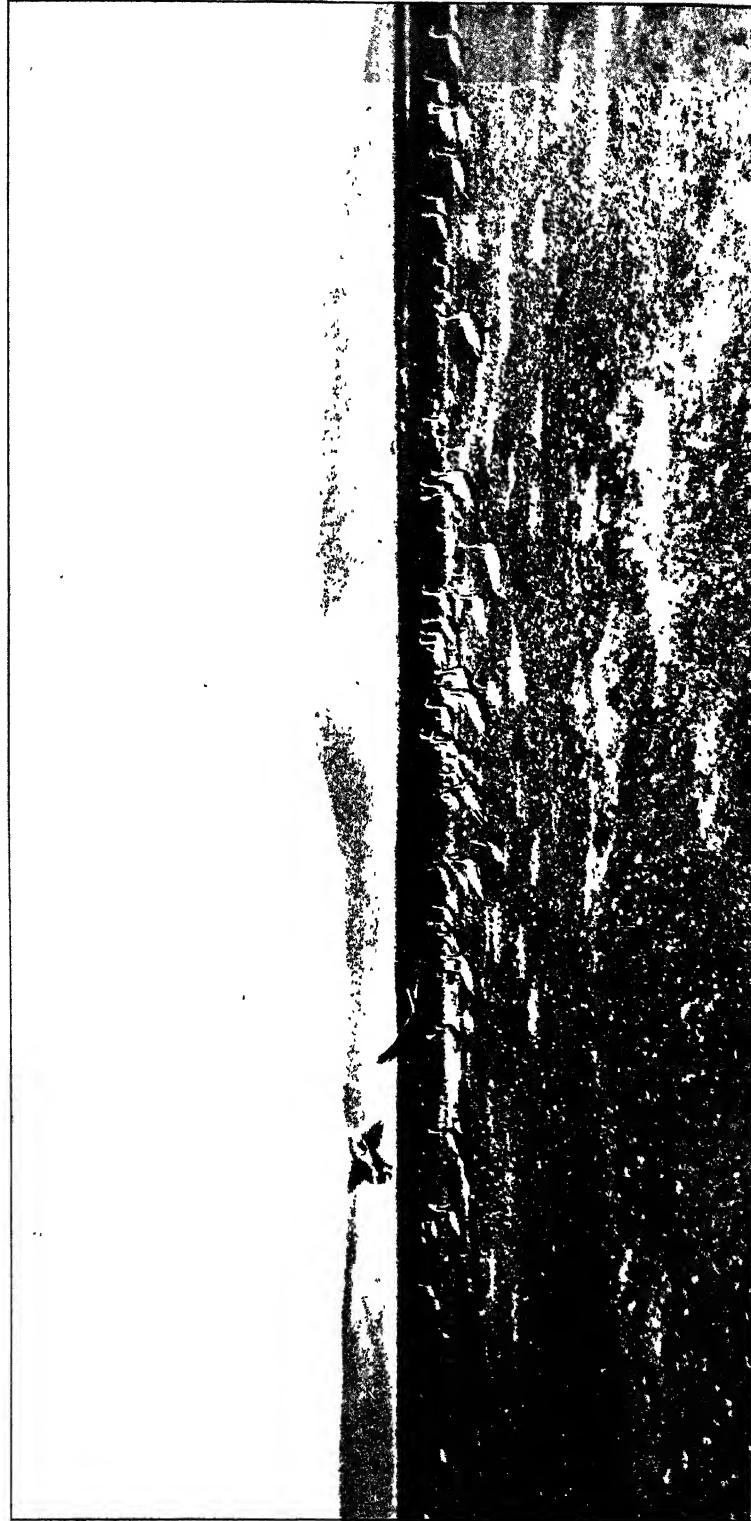
Captain Stein, I.M.S., Captain Kennedy and Mr. Macdonald took a considerable number of the eggs of this species from the Rhamtso lake, the majority of which have come into my possession or passed

through my hands. These are just like the eggs of *Anser anser*, but average smaller, and the measurements of the sixty I have seen were as follows:—

The maxima	...	<u>89·9</u>	\times	55·4	and	87·8	\times	<u>59·1</u>	mm.
The minima	...	<u>80·0</u>	\times	51·6	and	81·3	\times	<u>50·5</u>	mm.
Average of 50 eggs	...	84·2	\times	55·1	=	3·32	\times	2·25	inches.

The colour was pure white when they were unsmeared, and the texture exactly like that of the eggs of *A. anser*. Four or five appear to be the normal full number in a clutch. Most eggs are decidedly long ovals.

General Habits.—Speaking broadly, this goose is far more of a river than a lake or tank bird, though it is, of course, also found on the larger lakes and bheels. In Jessore and Khulna we only saw one flock on the Moolna bheel, and that not a large one, but on the rivers we saw several big flocks. Here I tried Hume's plan of floating down on them in boats, but a good many circumstances combined to prevent my having any success. In the first place, the water was almost everywhere too deep to enable a man to wade and push behind the boats; then, also, the fear of "muggers" was much too strongly felt by the men for them to remain in the water long enough to get near the birds; and, finally, these last were exceedingly wide-awake, and would not allow us to get within distance of anything but the longest shots. I did get one pair, eventually, but it was only by an adaptation of Hume's plan. The geese, of which there was a flock of about forty, were on a sand chur about fifty yards from the bank of the river, which was about 200 yards wide. I dropped down the river along the bank furthest from the geese, and then, when below them, worked across the river and got out on the same side as they were. Hiding at once in the rank grass on the bank, I sent the boat back to within a couple of hundred yards of the geese, and when I saw that their attention was fully taken up with it, managed to stalk to the edge of the water nearest where they were. Armed with wire cartridges (No. 2 shot), I thought I could do some execution on the flock as they sat on the bank, but after I fired at them only two remained and the rest flew off. The flock, however, seemed to consider that the boat was the aggressor, and sweeping round flew within twenty yards of me, and I knocked



NESTING GROUND OF BAR-HEADED GOOSE, RHAMTSO LAKE, TIBET, 14,000 ft.

over three with my second barrel. Of these three, one was snapped up as soon as it touched the water by a crocodile, and the same fate happened to the second before we got to it, whilst the third flew away again without offering another chance.

In the daytime, according to Hume, Tickell, and nearly all other observers, as well as my own observations, geese, of all kinds nearly, rest during the day on land near the edge of the water; they seem to prefer bare sandy churs, especially when these are surrounded by water, but failing such they rest on the banks. A few birds always seem to be posted as sentries, and they keep a wonderfully keen look-out, and are very hard to approach within reasonable distance. Mr. Theobald says that in Coimbatore, during the daytime, "they keep floating idly in the centre of some tank or river."

In Bengal, at all events, where the rivers are deep and "muggers" plentiful, I fancy that flighting at night offers the best chances of a bag. Where they are to be found in weedy lagoons, they can often be approached by dug-outs, with a small screen in the front of the boat composed of green branches or reeds, but when the water is open, and there is no natural cover, the birds are much too wily to be imposed on by the screen. On the other hand, if one goes in for shooting them as they fly overhead to and from their feeding-grounds, one cannot expect to obtain large bags, except with unusual luck. Mr. Reid, in 'Game-Birds,' narrates how he has got as many as thirty birds between sunset and 7.30 p.m., but, as a rule, less than half of this would be considered a good bag. Of course, the charm of variety is added to the enjoyment of the shoot, for in flighting almost any kind of duck may turn up and join the game-bag.

Hume's appeal to Indian sportsmen to try Prjevalski's plan of lying on the ground, and waving his hat at the geese in order to induce them to approach, seems to have met with no response; at all events, I can find no bags, heavy or otherwise, recorded as having been made thus.

They are, almost entirely vegetable feeders, and it is wonderful to see what damage a flock can do to young crops even in a single night; and where they are numerous, as they are in Upper India, and visit the same feeding-ground night after night, they take no small

percentage of the wretched villagers' winter crops. They will eat almost any young, tender, green stuff, but probably prefer the late rice crops to any other. They feed, as a rule, during the night-time, but, where they are not interfered with, commence to graze about four p.m., and continue on the ground until an hour or so after sunrise.

Their flight is typically goose-like, and in the usual V formation. Mr. Damant notes a very peculiar action of these birds:—

"They then appear flying in the form of a wedge, each bird keeping his place with perfect regularity. When they reach the lake, they circle round once or twice, and finally, before settling, each bird tumbles over in the air two or three times, precisely like a tumbler pigeon; after they have once settled, they preserve no regular formation."

As a matter of fact, each bird does not, as a rule, keep in its exact place in the V, but all observers have noticed that geese and other birds which adopt a V-shaped or line formation in flying constantly alter their position, each leader retiring after a few minutes to the rear, and the second bird taking its place, and then giving it up again in a short time to the bird immediately behind. This has been much remarked on in observations on migrating birds passing Heligoland.

I have never seen any geese of this species tame, but Hume says he has seen many, though they do not ever appear to assume the confidential lap-dog familiarity of the grey lag. Their call is rather harsher and more shrill than is that of the grey lag, and very easily distinguishable from it.

They arrive in India in the end of October, but in Bengal and Southern India few put in an appearance before the end of November. In the same way they leave these parts earlier than they do elsewhere, and there is little chance of any being found after the end of February.

(19) BRANTA RUFICOLLIS.

THE RED-BREASTED GOOSE.

Anser ruficollis, *Pallas, Spicil. Zool.* vi, p. 21 (1769) (South Russia).

Branta ruficollis, *Bengal Sporting Mag.* 1836, vii, p. 247; *Blyth, Ibis*, 1870, p. 176; *Oates, Game-B.* ii, p. 78; *Salvadori, Cat. B. M.* xxvii, p. 124; *Stuart Baker, J. B. N. H. S.* xvi; *Hartert, Vog. Pal.* p. 1299 (1920).

Rufibrenta ruficollis, *Alphéraky, Geese*, p. 140; *Stuart Baker, Indian Ducks*, p. 89 (1908).

Description. Adult Male.—“Entire crown and hind-neck black; the black of the crown extends through the eye to the chin and throat, leaving a large round white patch between the eye and the bill; on the ear-coverts a chestnut angular patch, surrounded with white, ending in a white band down the sides of the neck; neck and upper breast rich chestnut, surrounded below by a white narrow band; back, rump, lower breast, and upper abdomen black; upper tail-coverts, lower abdomen, and under tail-coverts white; flanks white, with black bands at the tip of the feathers; wings brown-black, the upper coverts with pale edgings, which on the middle and greater wing-coverts form two greyish bands; tail black; ‘bill almost black; irides hazel; legs and feet dark-brown, almost black.’ (*Saunders*).” (*Salvadori*.)

The Female only differs from the male in being somewhat smaller, the colours are equally bright.

Young birds in second year.—“Shiny-black of plumage replaced by brown; instead of a rufous patch in the aural region, a similar grey-brown one, with more or less admixture of rufous plumules, the whole patch being of indefinite outline, mingling with the surrounding whitish (not white) streak. As regards the rufous colouring of the anterior part of neck and upper breast, it can only be said that it is a lighter (rufous-buff) than in adult birds. White transverse bar, bordering inferiorly the rufous of upper breast, less definite, and no black margin between this and the rufous, or only in the shape of a few black-brown plumules.

“Tail-feathers with very narrow white or whitish tips. Under side of wings and axillaries grey-brown.

“Feathering on chin with a large admixture of white featherlets, giving it a finely mottled appearance.

“Tips of greater wing-coverts light buff; consequently both transverse bars across the wing are of this colour and not white.” (*Alphéraky*.)

Measurements.—“Wing 13·7 to 14·1 inches, tail 5·90 to 6·0, culmen 1·0 to 1·1, tarsus 2 to 2·04.” (*Alphéraky.*)

Hartert gives the wing as 345 to 365 mm., bill 23 to 26 mm.

Distribution.—The Red-breasted Goose has been found to occur practically throughout Europe, though there is as yet nothing on record as to its appearance in Spain. To the extreme west it is rare, and in the west generally less common than in the east; it occurs in Persia and Turkestan, so that its occasional occurrence in India is by no means surprising.

Its first *probable* appearance in India was recorded in the old ‘Oriental Sporting Magazine,’ and from that time (1886) until, in the pages of the Bombay Nat. Hist. Society’s Journal, I noted Mr. Mundy’s having seen it in Dibrugarh, no one had ever come across it again. Mr. Mundy saw the bird on the Brahmapootra, and, though he failed to obtain a specimen, he took very careful notes of its colouration, which, on being repeated to me, were ample enough to enable me to identify the bird as the Red-breasted Goose. Finally, in March, 1907, I myself was fortunate enough to see five specimens on a chur in the Brahmapootra, just below Gowhatta; they arose a long way off as the steamer drove upstream towards them, but turned and flew past us within 60 to 100 yards, and there could have been no possible chance of mistaking them.

Nidification.—It breeds throughout the tundras of Western Siberia, and is also said by Pearson to breed in Lapland (“*Ibis*,” 1896, p. 210).

Middendorff got its eggs on the Boganida, slightly incubated, on the 25th June, Seeböhm took its nest on the Yenesei in late June, 1877, and Popham on the same river in 1895. In the latter case the four nests found were taken at the foot of a cliff, also tenanted by a peregrine falcon. The eggs are described as creamy-white, and much like those of the bean-goose, but with a very fragile shell, through which the green tint of the lining membrane shows.

The eggs vary from 2·71 to 2·83 inches in length, and from 1·73 to 1·77 in breadth, and there were seven, eight, or nine eggs in the full clutch.

Zhitnikov, as quoted by Alphéraky, gives a most interesting account of this most beautiful goose. He writes:—

"Thick clouds of geese (of both species) got up from the shores of the lake, cackling incessantly, and flew off to the steppe; and the abandoned lake now contained only sheldrakes and avocets. A belated gaggle of geese had alighted near my place of concealment, but a white-tailed eagle at once dispersed them, giving me no chance of shooting.

"We sat in our pits to no purpose until 8 o'clock, and then went to the river, to drink tea, on our way putting up Brahmini Ducks feeding in the steppe grass. Having finished our tea—a nasty, muddy infusion from the river, but not brackish—we again took up our posts in the pits, after carefully screening them with grass.

"At ten in the morning the call of the geese resounded from the Atrek; a series of black streaks showed from beyond the river; nearer and nearer they flew, and the whole steppe round was filled with clouds of birds. To gain any idea of the vast masses that collect to migrate, one must actually see this host of geese, and hear their cackle, which drowns the human voice. Without any exaggeration, it may be said that there were tens of thousands of birds, some of the flocks containing from at least 300 to 500 birds. Flock after flock arrived on the lake; the first parties were followed by others, and from beyond the river appeared the ever-approaching squadrons. They flew for the most part in masses, and only small flocks of ten to twenty geese disposed themselves in transverse lines.

"It may here be added that in winter the *kazarkas* generally flew to the water and back in crowds, or more rarely in a transverse drawn-out line, but very seldom in a single line or in a 'key,' that is, in a longitudinal line or wedge, like swans, most geese and cranes.

"The flocks on arrival settled above the lake, and seeing nothing suspicious, settled, although far from the shore; they flew very high and dropped vertically on to the water. The majority of the flocks consisted of *Anser erythropus*; but there were also many of *A. ruficollis*, easily distinguished by the deep black of the belly, the bright white streak on the wings, and their squeaky, shriller-toned note compared with the white-fronted species, as well as their notably inferior size. The last flocks, seeing their fellows already sitting on the water, descended much lower as they approached the lake."

Dr. Radde says that their flesh is dry and tough, but this refers to birds on migration; and Lepekhin says that its flesh "is not disagreeable, and is excessively fat." It is said to be easily tamed, and to become as familiar and confiding when in a domestic state as it is wild and cautious when in a state of nature.

Subfamily ANATINÆ.

Key to Genera.

A. Lower portion of tarsus in front with small reticulate scales *Dendrocygna*, p. 93.

B. Lower portion of tarsus in front with a row of transverse scutellæ.

 a. Speculum wanting *Marmaronetta*, p. 202.

 b. Speculum always present.

 a¹. Outer web of inner secondaries chestnut.

 a². Colouration pied, chestnut, black and white *Tadorna*, p. 109.

 b². Colouration all rufous-chestnut of different shades, except on quills . . . *Casarca*, p. 114.

 b¹. Outer webs of inner secondaries not chestnut.

 c². Bill spatulate *Spatula*, p. 196.

 d². Bill not spatulate.

 a³. Upper wing-coverts blue or grey-blue *Querquedula*, p. 188.

 b³. Upper wing-coverts not grey-blue.

 a⁴. Tail long, with the central tail-feathers acuminate and extending well beyond lateral tail-feathers *Dafila*, p. 181.

 b⁴. Central tail-feathers not elongated, and tail moderate in length.

 a⁵. Bill broad, about the length of the head *Anas*, p. 123.

 b⁵. Bill not very broad and shorter than the head.

 a⁶. Upper and lower tail-coverts extending beyond end of rectrices *Eunetta*, p. 143.

- b⁶.* Upper and lower tail-coverts not extending beyond end of rectrices.
- a⁷.* Central feathers not acuminate and not extending beyond lateral ones . . . *Chaulelasmus*, p. 148.
- b⁷.* Central tail-feathers more or less acuminated and extending slightly beyond lateral ones.
- a⁸.* Bill small and about equal in breadth throughout. . . . *Mareca*, p. 155.
- b⁸.* Bill moderate and tapering towards tip . . . *Nettion*, p. 162.

Hartert has recently eliminated a very large number of genera amongst the ducks. Thus under *Anas* he includes *Querquedula*, *Chaulelasmus*, *Mareca*, *Eunetta*, *Dafila* and *Marmaronetta*. Undoubtedly many of these genera are very closely allied, and the characters given by Blanford as reasons for separating them are in some cases more specific than generic. Especially is this so as regards *Anas*, *Querquedula* and *Chaulelasmus*. For the present, however, I retain Blanford's genera, as they are both convenient and well-known.

Genus DENDROCYCNA.

The genus *Dendrocygna*—or *Dendrocygna*, as most of us would probably still prefer to call it—contains our two widely-known species of Whistling-Teal as well as seven others, some of which are found in every continent except Europe.

Whistling-Teal are amongst the few *Anatidæ* that perch constantly on trees, and also breed on them. The sexes are similar in plumage, though the female is often slightly smaller than the male. Many systematists used to consider that they were more closely allied to the *Anserinæ* than to the *Anatinæ*, and in many ways they do clearly approach the former, more especially, perhaps, in the formation of the legs and bills.

They are non-migratory ducks, or only migratory in a very local way.

Key to Species.

- A. Upper tail-coverts whitish, sometimes marked with black. *D. fulva.*
- B. Upper tail-coverts uniform chestnut *D. javanica.*



THE GREATER WHISTLING TEAL.

Dendrocygna fulva.

$\frac{1}{3}$ nat. size.

(20) DENDROCYCNA FULVA.

THE GREATER WHISTLING-TEAL.

Dendrocygna major, *Jerdon*, *B. of I.* iii, p. 790; *Hume*, *Nests and Eggs*, p. 640; *id. S. F.* iii, p. 193.

Dendrocygna fulva, *Hume & Davis*, *S. F.* vi, p. 488; *Hume*, *ibid.* vii, p. 463; viii, p. 115; *Legge*, *B. of C.* p. 1069; *Hume & Marsh. Game-B.* iii, p. 119; *Hume*, *Cat. No. 953*; *Parker*, *S. F.* ix, p. 487; *Oates*, *ibid.* x, p. 245; *id. B. of B. B.* ii, p. 274; *Barnes*, *B. of Bom.* p. 399; *Hume*, *Nests and Eggs* (Oates' ed.), iii, p. 286.

Dendrocygna fulva, *Salvadori*, *Cat. B. M.* xxvii, p. 149; *Blanford*, *Avi-fauna B. I.* iv, p. 432; *Stuart Baker*, *J. B. N. H. S.* xi, p. 556; *id. Indian Ducks*, p. 93 (1908).

Description. Adult.—“Head, neck, and lower parts deep reddish-ochraceous, passing into cinnamon on the flanks, where the longer feathers have a broad mesial stripe of pale ochraceous, bordered by dusky; crown ferruginous, nape with a distinct brown-black stripe, commencing at the occiput; middle of the neck whitish, minutely streaked with dusky on the edges of the feathers; prevailing colour above brownish-black, the dorsal and scapular feathers broadly edged with cinnamon colour, giving a barred appearance; lesser wing-coverts chestnut; upper and under tail-coverts buffy white; quills and tail dark brown.” (*Salvadori*.)

Colours of soft parts.—The bill varies from dusky-black, black on the terminal third and slaty at the base, to dusky throughout, merely tipped black, and much shaded with bluish lead-colour at base and basal half. In the same way the legs and feet vary from quite pale dusky plumbeous, more or less of a blue tint, to almost black. According to Merrill, the legs are bright slaty-blue, but personally I have seen no Indian birds with brightly-tinged legs. Claws black; irides are light to dark brown.

Measurements.—“Length 18 to 20 inches, wing 8·10 to 8·90, tail 2·2, culmen 1·66 to 1·95, tarsus 2·10 to 2·4, middle toe 2·30 to 2·8.” (*Salvadori*.)

Jerdon gives the length as 21 inches and wing 9·1. The largest I have seen had the wing 9·20 inches, which is practically the same.

The Female only differs from the male in being slightly smaller; length 17 to 19 inches, wing 7·85 to 8·25. The female obtained by Captain Shelley from Nyasaland measured, wing 9·1 inches, tarsus 2·1, and culmen 2·2. This gives a larger bird, with proportionately even larger bill, than any Indian bird which I have seen or of which I can find the measurements. Three other birds have been obtained in Nyasaland.

Of course, in some bheels and lakes where they are especially numerous, several small flocks may be seen feeding together, forming a total of 100 birds or more, but, on being disturbed, it will be found that, as a rule, though rising *en masse*, they soon divide again into parties.

They are wilder birds than their smaller cousins, and also stronger and quicker on the wing ; indeed, when once well started, they are no mean fliers, and require a straight gun to knock them over. One cannot well describe the difference in the voice of the two Whistling-Teals ; but it is recognizable, and I think it consists in the bigger bird having a shriller whistle than the other, though it is not such a noisy bird. I doubt if they perch as much as *D. javanica* does ; the latter bird often takes to trees in the day-time without any apparent purpose, except to rest, but *D. fulva* does not seem to do this. Of course, both birds, when perching, choose large boughs and branches, as they have no great grasping power, and could not retain their hold on small ones, especially if there was any wind to sway them about. As Hume remarks, this whistling-teal is far more often seen on land than is the smaller species, and he also notes their goose-like gait. Their legs are, as we all know, set forward much as are those of geese, and in consequence they naturally walk freely and well as do those birds. I have noticed them resting during the heat of the day on the spits of grass-covered land which run far out into the larger bheels. One or two observers have said that they are more river and clear water frequenters than are others of the genus, but this I have not myself confirmed. Every large bheel and expanse of water which had cover on it, contained more or fewer of these birds, and many a tiny tank or rush-and-weed-covered backwater held its flock ; but I have never yet met with them on the open waters of the Ganges and Brahmapootra, though I have visited them often, and though these run through their favourite haunts.

These duck or teal, are practically as omnivorous as is the domesticated duck, and will eat almost anything they can get hold of, preferring, perhaps, a vegetarian to a meat diet.

I can give no thrilling accounts of shooting these teal, as they are not considered game in Bengal, and when we do shoot them

we do not talk of it. Of course a good many are shot for the servants, boat-men, etc., who enjoy them immensely, and the fishier they are, the more tasty they consider them. I have noticed no difference in the flavour of the two species of whistler, and cannot say I think much of either; they do not make bad curry or mulligatawny soup when one can get nothing else, and I have eaten them in preference to the domestic *moorghi*; but at this point my praise of them, as an edible quantity, must end.

(21) DENDROCYCNA JAVANICA.

THE LESSER OR COMMON WHISTLING-TEAL.

Dendrocygna arcuata, *Hume*, *S. F.* i, p. 260; *id. Nests & Eggs*, p. 639; *id. S. F.* ii, p. 315; *Ball*, *ibid.* p. 483; *Oates*, *ibid.* v, p. 169.

Dendrocygna awsuree, *Jerdon*, *B. of I.* iii, p. 786.

Dendrocygna javanica, *Hume & Davis*, *S. F.* vi, pp. 486, 488; *Crupps*, *ibid.* vii, p. 311; *Hume*, *ibid.* viii, p. 71; *Hume*, *Cat.* No. 952; *Legge*, *B. of C.* p. 1069; *Hume & Marsh*, *Game-B.* iii, p. 109; *Bingham*, *S. F.* ix, p. 198; *Park*, *ibid.* p. 486; *Oates*, *ibid.* x, p. 245; *id. B. of B. B.* ii, p. 273; *Barnes*, *B. of Bom.* p. 398; *Hume*, *Nests & Eggs* (*Oates' ed.*) iii, p. 284.

Dendrocygna javanica, *Salvadori*, *Cat. B. M.* xxvii, p. 156; *Blanford*, *Avifauna B. I.* iv, p. 430; *Stuart Baker*, *J. B. N. H. S.* xi, p. 562; *id. Indian Ducks*, p. 99 (1908); *Ireland*, *J. B. N. H. S.* xxv, p. 499 (1918).

Description. Adult Male.—Forehead and crown brown, paler and reddish on the forehead, and darkest on the occiput; remainder of head and neck pale fulvous-grey, paler on the cheeks, and almost white on the chin and upper throat; this colour gradually changes into yellowish-grey or yellowish-fulvous on the breast, which again changes into the chestnut of the lower part, and this again, in its turn, fades into the dirty creamy-white of the lower tail-coverts. Above, the colour of the neck changes into brown on the scapulars and back, where the feathers are broadly margined with golden-rufous; rump black; upper tail-coverts chestnut; tail brown, very narrowly margined with paler dingy-rufous; lesser and median wing-coverts chestnut, the latter sometimes mixed with ashy; greater coverts dark-ashy, rarely splashed with chestnut next the primaries; quills black, the inner secondaries more brown and edged with dingy ash-colour; flanks chestnut, the feathers sometimes centred paler; axillaries brown.

Colours of soft parts.—Irides dark-brown; bill almost black to slaty-grey, with the nail darker; feet slaty-brown to dull black. “Eyelids bright yellow.” (*Salvadori*.)

“The irides are deep brown; the eyelids bright yellow to pale golden; the legs and feet generally dark, at times somewhat pale plumbeous-blue, often dusky in patches, and on the webs and claws blackish; bill plumbeous to pale dull blue at the base, shading to black at the tip, the



THE LESSER WHISTLING TEAL.
Dendrocygna javanica.
 $\frac{1}{3}$ nat. size

bill in some having a greater extent of plumbeous, in others black; the membrane between the rami of the lower mandible is generally pinkish." (Hume.)

Measurements.—Length 16 to 17.5 inches, wing 6.92 to 8.04, tail about 2.5 to 3, tarsus 1.6 to 1.92, bill from gape 1.7 to 2.06.

"Length about 18 inches, wing 8, tail 2, bill at front 1.5, tarsus 1.75, midtoe 2.4." (Jerdon.)

Weight about 1 lb. to 1 lb. 6 oz., the latter weight unusual.

Female.—Like the male, but perhaps averaging smaller.

The Young.—“When just able to fly, do not differ very much from the adult, but are everywhere duller coloured. The margins to the feathers of the interscapular region are inconspicuous and dingy fulvous, and the entire lower surface a rather pale, dull, fulvous-brown.” (Hume.)

Young in Down.—“The colour nearly jet black, a white eyebrow and a very conspicuous white patch on the back of the head; a white patch at the wings and two other white patches on either side of the lower back and rump.” (Livesey.)

Distribution.—There are few places in India where this very common bird may not be found, but outside our limits it does not extend very far. It is obtained throughout the Indo-Chinese countries and Siam, and in the Loochoo Islands, the Malay Peninsula, Sumatra, Borneo, and Java. Mr. C. B. Rickett obtained a specimen near Sharp Peak, close to Foochow, and it has been obtained on one or two other occasions in China. The bird shot by Mr. Rickett was killed in November.

The specimen said to have been brought home from Lake Tchad, in Central Africa, seems to have been recorded as the result of some mistake.

Nidification.—Normally and typically both our Indian *Dendrocygnæ* build nests on trees, or lay their eggs in their hollows; often they make use of the deserted nests of other birds, and sometimes they build nests on or near the ground, in reeds, grass, or other bushes. The recorded and authenticated instances of the Common Whistling-Teal laying its eggs in nests placed on the ground are, however, fairly numerous.

Barnes, in vol. i of the B.N.H.S. Journal, recorded the fact that in Neemuch he never found their nests on trees, but always amongst rushes growing on the edges of banks.

Oates, in ‘Birds of British Burmah,’ says that he has “frequently

found its nest in Pegu in July and August—a mass of dead leaves and grass placed on a low thick cane brake in paddy-land, and containing six very smooth white eggs Those nests I myself found were invariably situated, as above described, on cane brakes."

Jerdon also says that :—

" It generally, perhaps, breeds in the dryer patches of grass on the ground, often at a considerable distance from water, carefully concealing its nest by intertwining some blades of grass over it."

Lastly, Legge notes in ' Birds of Ceylon ' :—

" It sometimes builds on the ground among the rushes or tussocks, and even in reeds, the nest half floating in water."

In ' Game-Birds ' Hume's notes on the nidification of this species are very full and interesting, containing practically every known situation for the nest. Thus Captain Butler took the nest from a tussock of grass growing out of a dried stick fence ; Mr. Doig and he took them frequently from creeper-covered tamarisk jungle growing in water, and the former also found them placed on the tops of clumps of bull-rushes.

Mr. J. Davidson also found the nests on the ground in Mysore, where they were placed in tufts of grass which formed islands in the middle of weedy tanks.

Cripps found that in Dacca, Furreedpur, and Silhet they breed both on trees and on the ground.

In the Dibrugarh district of Assam I found that these Whistling-Teal almost invariably placed their nests on high pieces of land standing in swamps. In the north of the district I noticed that they were locally migratory. In June, in certain places, not a single bird was to be seen, perhaps, in a long morning's walk, but in July, by the time the water had collected in the low-lying land, forming wide though shallow stretches of water, the birds had gathered in hundreds, and were busy over their domestic arrangements. Often across these pieces of water the villagers had made raised banks from one side to the other, either to cut off their special patch of cultivation or as a path. The centre of these banks were, as a rule, trodden bare, but the sides were, more or less, covered with dense grass, some two or three feet high, and in such places the Whistlers placed their nests.

They also made use of the high ground surrounding the deeper pieces of water, which formed small banks in the cold weather, but in the rains formed tiny circular islands. The nests here were massive structures of grass and water-weeds, and were always very well concealed, the covering grass in every case forming a dome completely covering them and hiding them from sight, even when one stood actually over them.

Except in this district, I have never seen a nest actually on the ground, but have taken one or two from situations very close to it. In Cachar, at the foot of the hills, there is much broken ground, often intersected by nullahs which widen out here and there into swamps and bheels. Here the Whistling-Teal is in its element, and has an enormous variety of sites to choose from. The one I found most often selected was some clump of trees, generally babool or a stunted species of large-leaved, densely-foliaged tree which often grows actually in the water. When the rains are on, these small clumps form oases in the centre of a watery desert, and when the floods are at their height show merely a few feet of their crests above water, on one of which these ducks build their nests, rough-and-ready constructions of weeds, sun-grass, and rushes, rarely lined with a few feathers. Sometimes a good many twigs are used, more especially when the nests are placed in babool trees, where, owing to the support being less compact, the nest itself is bound to be stronger and better put together. The situation next most often chosen as a site for the nest is up one of the arms of these same bheels or swamps, which seldom, if ever, have deep water in them, but at the same time, from collecting moisture drained off surrounding hills, are always wet and moist. In these places the canes, reeds, and other vegetation grow to a great height, often twelve feet or more, and are so rank and tangled that their tops will bear no inconsiderable weight. When building the nest in one of these tangles, the birds place it some two or three feet from the top, the density of which protects it greatly from rain, &c. The nest itself is one of the roughest description; a mere thick, coarse pad of grass, reeds, and perhaps, a few creepers, measuring some eighteen to twenty-four inches in diameter, and with no more depression in the centre than is caused by the birds constantly sitting in it.

Now and then the nest is found on trees close by villages and near some tank or piece of water. When on this kind of tree the nests may be placed either on one of the bigger forks or in a large hollow, and when in the former place are quite well-built nests of twigs lined with grass and a few feathers. If, on the contrary, they are in the hollows, the nest is scanty, and sometimes merely consists of the fragments naturally contained in the hole.

In Rungpur I found nearly all my nests on trees, though very often they were not built by the birds themselves, but they used old crows' nests sometimes, old kites' nests frequently. I should mention that the crows' nests the birds used were always those of *C. splendens*, and it seems to me very remarkable that this duck should find room to lay and hatch some six to a dozen eggs in a nest as small as that usually built by *C. macrorhynchos*, as this crow generally makes such a compact, neat nest, with very little waste room about it. I should imagine the jungle-crow in Hume's anecdote, given below, must have been an extravagant, wasteful bird, or else have taken house-rent from the teal and charged per square yard of room.

Most nests are not placed at any great height from the ground, seldom over twenty feet or so, but I have taken one or two from far greater heights.

As regards the number of eggs laid, there is a good deal of difference in the maximum normal number as estimated by various observers.

Jerdon, Butler, Doig, Davidson, Cripps, and I, myself, consider about eight to ten to be the normal number laid, though in Cachar the former number is the largest I remember taking. Oates gives six or seven, whilst Anderson says that ordinarily this bird lays a dozen.

In Dibrugarh, where I found very many nests, indeed sometimes seven or eight in a morning, I found six to eight to be the normal number, though I once found eleven. On the other hand, I several times saw hard-set clutches numbering only four or five.

Probably eight to ten is the number most often laid, and whilst in some districts, probably to the east, they may average fewer, yet, on the other hand, in some more to the west, the average clutch may be somewhat larger.

The eggs are like those already described as belonging to *D. fulva*, that is to say, they are very spherical ovals, but little compressed at the smaller end, and in texture are very smooth and fine, but neither very close-grained nor glossy, and somewhat chalky on the surface. They are nearly pure white, sometimes inclined to ivory-white when first laid, but stain quickly, and soon lose the faint gloss they sometimes show at first.

Hume, in a footnote to 'Game-Birds,' says that the lining-membrane of this teal's egg is a delicate salmon-pink, and gives a faint rosy tinge to perfectly fresh unblown eggs. I have now examined a huge series of these eggs, but have failed to find any with the lining-membrane so coloured. When fresh, all the eggs blown by me have had this membrane a very dull dead lemon-yellow, and when dry it is of a dead grey-white; I should have said that the tint of eggs in the condition he describes was more of a very faint and very dull creamy yellow rather than rosy, but, as a matter of fact, the shells are thick and have very little transparency, and as a rule the yolk gives no tint at all to the shell.

All my eggs come within the average given by Oates in Hume's 'Nests and Eggs,' viz., length from 1.72 to 2.0 inches, and breadth from 1.4 to 1.6. The average of over 150 eggs taken by me is, however, larger, and measures 1.89 × 1.52 inches.

The duck is a very close sitter, and will not move from her eggs until very closely approached; indeed, she may sometimes be caught by hand. Mr. Brooks thus caught a duck on her nest, which was placed at the bottom of a hollow in a dead stump.

The drake keeps much to the tree where the nest is, and spends much of his time alongside his mate on the nearest comfortable perch, but I have never been able to ascertain whether he assists in the incubation.

In different parts of the country they breed from late June up to September; in Eastern Bengal principally in July, in Western Bengal in late July and early August, in Western India later still. Barnes says that in Rajputana they breed in August and September.

In Ceylon it is one of the birds that does not alter its habits of breeding much, and there they lay in June and July.

General Habits.—This Whistling-Teal is, in many parts of India,

a local migrant, visiting them only during the rains; and this we can well understand, knowing how many places in Northern and North-western India change their character with the advent of the rains from utterly dry, burnt-up tracts to well-watered, wet ones.

Cripps says that they are not found in Dacca during the cold weather; but this I know is not now the case, as I have seen them there at that season, only they keep to the wetter portions of the district, and doubtless many do move to Silhet, where there is never any want of swamps and bheels. In the same way many birds leave Cachar as the water subsides and go into Silhet. In Bengal I think the question is entirely one of water-supply, and where the water is sufficient there these teal will remain independent of the season. When, on the other hand, the water fails them, they go off elsewhere. In Sind they are rainy-weather visitors only, and they also leave the Deccan in great numbers as the waters dry up at the end of the cold weather. They are found throughout the Terai, but do not ascend very high, and most probably Hodgson's specimen was not really obtained in Nepal.

In Cachar they are extremely common all the year round in the plains, but never ascend the hills at all.

Hume, writing of this bird, says:—

"It is essentially a tree Duck; it must have trees as well as water, and hence its entire absence from some pieces of water, in treeless parts of Rajputana, for instance, where other species of Duck abound during the cold season. Yet it prefers level, or fairly level, tracts to very broken hilly country, and again, though in some places, e.g., at Tavoy, it may be met with in rivers in enormous flocks, it, as a rule, prefers moderate-sized lakes and ponds to rivers.

"Owing to these preferences there are many tracts, as, for instance, portions of the Deccan, where it is extremely rare."

This is quite true, but in Eastern India, more especially Bengal, nearly all the country is more or less well supplied with trees and also water, so that local migrations are not necessary, and therefore not indulged in except in the very narrowest sense of the word.

The same applies to Ceylon, where Legge describes them as permanent residents, but moving to and from certain places with the season.

Hume says that it seems to be a permanent resident only in districts which are *well-drained* as well as possessing other attributes. This is certainly not the case in many or most parts of Bengal, where the birds are resident, however ill-drained the district may be.

It is quite the exception for them to be seen in any number on rivers and open *clean* pieces of water; they prefer tanks, backwaters, swamps, and lakes, the latter especially when they are well covered with weeds or vegetation.

My first duck-shooting in India was obtained in Jessore, and until then I had no idea of the vast numbers in which duck of different kinds assemble. Teal of sorts were common, and gadwall, pintail, and many ducks also, but the Whistling-Teal must have numbered at least one hundred to each one of all the other kinds included. It was almost incredible, the enormous flocks in which they assembled; thousands and thousands flew on every side of us as we shot, and the dull rumblings of their wings were heard a mile away or more, even before they were disturbed. We did not, of course, shoot them, but we found them a horrible nuisance, for they were quite as wild as the other ducks, and whenever a careful stalk had enabled us to get almost within shot of a lot of fat gadwall, or nice flock of blue-winged teal, or other much-to-be-desired game, some wretched Whistling-Teal was sure to pop out of an unnoticed piece of cover and make off with loud whistlings and whirring wings, followed by every other duck within two or three hundred yards. A few, perhaps, of the Whistling-Teal might pass us within shot, but it was almost certain that the duck we wanted would not.

It is very difficult to estimate how many birds there were on the Moolna Bheel when I first visited that grand shooting-ground, but there must certainly have been sometimes *hundreds* of thousands on the wing at once.

Often when we approached some piece of water, where the reeds and rushes grew so rank that we got right in before we fired, the Whistlers would rise at the shot in masses before us, almost bearing out that old figure of speech "darkening the air." I was greatly struck on these occasions by the attitudes of the birds, which

reminded me much of ancient prints on duck-shooting, the birds with their long necks outstretched rising straight up for some height until they got fairly started, when they flew off parallel with the water, generally about thirty or forty feet up, and not very fast in spite of their noisy flight. Hume, Legge, and many others have mentioned the rapidity with which they beat their wings, and have also noted the smallness of the result when compared with the amount of exertion used. When found in small flocks, that is to say, up to about fifty or so, on tanks, ponds, and small pieces of water, they often fly round and round the place before leaving it, and more particularly is this the case when, there being no other water very close by, they are loath to quit the piece from which they have been roused. In the vast pieces of water in the delta of the Ganges I did not notice this habit so much. When first disturbed, and the birds get up all at once, it would seem that they form a flock numbering some thousands; but they soon divide into smaller ones, seldom numbering over two or three hundred, and then with a preliminary wheel or two fly off to some other part of the swamp. Why they should be so wild in the Sunderbands and yet so tame in most parts of their habitat, I cannot explain. They are not much shot at, as the inhabitants are nearly all fisher-people who possess but few guns, and who get their duck by driving them into nets and not by shooting them.

I have never, in any part of Bengal, known them to be so tame as to require stoning to induce them to leave a tree, as Hume says is necessary in many parts; yet in Rungpur, Furreedpur, and some other districts they are so confiding that to get a sitting shot would be a very easy feat were it desirable, and the birds do not fly until the last moment. They perch very freely on trees, even during the non-breeding season, but I think that, as a rule, they rest, when in flocks, on the water and not on trees, though sometimes, of course, they do rest during the heat of the day on trees. Hume, indeed, says they generally rest thus, and this habit again may be one of locality, varying in the different parts they affect.

At night I think they roost almost invariably on trees, and even where they are shy and wild, and feed in the evening and early morning, the middle of the night is probably passed roosting on trees.

They very rarely rest on land, as do their larger brethren, *D. fulva*, and I have never personally seen them thus actually on land. The only time I have seen a flock of any size on a tree was once when, passing under a huge banyan tree, a large flock flew out just overhead. I was riding when they started, but I remember that as they departed out of sight I viewed the last of them from the ground on which I was reclining in a semi-sitting posture. I forget now which got out of sight first, the Teal or my pony—the latter a skittish T. B. Waler.

Banyan trees are very favourite resorts of these birds, because, doubtless, of the large horizontal branches which are so numerous, and which give them good foothold without calling on the powers of grasping to too great an extent. They are quick, strong swimmers, and very good divers also, but I have not known them dive and remain under water, holding on to reeds, etc., as some ducks do. As a rule, a wounded bird dives and scurries under water at a great pace for about ten to twenty yards, and then reappears, once more to dive as the would-be catcher thinks that at last he has got it.

They feed on anything and everything, but bring up their young principally on animal food, and they themselves, in an adult state, probably prefer vegetable food. They graze often in the rice-fields, but only when the plant is very young, and I have seen them grazing on the coarse dhub-grass which often grows on sandy spots at the edges of tanks and jhils in the cold weather.

I have found that they eat large quantities of a very small fresh-water snail; this has a very brittle shell, and so is probably easily crushed and digested. These snails might account for the flavour of which the bird is unfortunately so often the possessor. Anyway, it is most rare to find a Whistling-Teal fit to eat, though it is not an impossibility to get such, a young bird just at the commencement of the cold weather being the most likely to furnish an edible dish. At the same time I have occasionally found them to be really excellent eating.

Their note is described by their name, and is a regular whistle, not very clear, rather sibilant, and by no means harsh or shrill. It is uttered constantly whilst on the wing, especially when first rising and during the first few wheels. I have also heard them, during the

breeding-season, give vent to a low chuckling, not unlike the garrulous notes of the cotton-teal, but more nearly approaching the quack of a true duck.

They are most charming little ducks in captivity, and most easy to tame; indeed, so confiding do they become that it is often possible to keep them in complete freedom without their making any attempt to leave the piece of water on which they reside. They soon learn to come when called and be fed out of the hand, and even strangers seem to in no way distract them.

In captivity they whistle freely as they walk and swim about, and when called soon get into the habit of whistling in reply. They have a curious propensity for walking very great distances, when tame, in search of food, returning home in the evenings, etc., and will thus often walk several hundred yards rather than fly. When there are several birds kept all together, they nearly always walk along in a line just as geese so often do.

No article on ducks could possibly be complete without Hume's story of the Whistling-Teal, crows, cat and dogs, so it must be here quoted in full:—

“ I once saw a good, large, half-wild village cat spring down upon a duck, which was sitting on her nest in a broad four-pronged fork of a mango tree. The duck did not whistle in the usual manner, she positively screamed; in a second the drake dashed at the cat, and to my surprise down came a black crow (*C. macrorhynchus*), not, as any one would have thought, to steal the eggs in the confusion, but to assail the cat with his claws and beak as if his own homestead had been attacked. In less time than it takes to describe, the cat was squalling in her turn, and fled up one of the branches, pursued closely by the drake and the crow, who were immediately joined by another crow, and the three made it so hot for pussy that she sprang to the ground, where my dogs, aroused by the uproar above (the noise those two crows made was astounding), were awaiting her, and before I could interfere, and before she quite recovered the jump of some 35 or 40 feet, killed her outright. But the strangest part of the business was that the villagers assured me that this nest was the crows' own nest, and that *they lent it every year*, after their young had flown, to the Whistling-Teal. I should have verified this the next spring, but left the Mynpooree district, and never again had a chance of visiting the spot.”



THE SHELDRAKE.

Genus TADORNA.

This genus consists of two species, one of which has a wide range throughout Europe, Asia, and Africa, the other being confined to Australia, the Moluccas, and Papuan Islands. The male bird possesses a fleshy knob at the base of the upper mandible, which is highly developed during the breeding-season.

(22) TADORNA TADORNA.

THE SHELDRAKE.

Anas tadorna, *Linn. S. N. x. ed. i*, p. 122 (1758) (Sweden).

Tadorna cornuta, *Hume, S. F. i*, p. 260; vii, p. 492; viii, p. 115; *id. Cat. No. 956*; *Hume & Marsh. Game-B. iii*, p. 136; *Barnes, B. Bom.* p. 400; *Salvadori, Cat. B. M. xxvii*, p. 171; *Stuart Baker, J. B. N. H. S. xi*, p. 571; *Young, ibid. xii*, p. 573; *Betham, ibid. xiii*, p. 187; *Inglis, ibid. xiv*, p. 393; *Blanford, Avifauna B. I. iv*, p. 427; *Stuart Baker, Indian Ducks*, p. 109 (1908); *Kinnear, J. B. N. H. S. xx*, 519 (1910); *Hopwood, ibid. xxi*, p. 1220 (1912); *Higgins, ibid. xxii*, p. 399 (1913); *Inglis, ibid. xxiii*, p. 367 (1915); *id. ibid. xxiv*, p. 824 (1916).

Tadorna vulpanser, *Jerdon, B. of I. iii*, p. 794.

Description. Adult Male.—“Head and upper part of the neck dark glossy green; round the lower neck a broad white collar: a band of rich chestnut covers the upper part of the back, the space before the bend of the wing, and the upper part of the breast; remainder of back, rump, and upper tail-coverts white: scapulars black, except the inner ones, which are white; a band along the middle of the breast and belly dark brown; sides and flanks white; under tail-coverts rufous; wing-coverts white, primaries very dark brown; speculum on the secondaries green; long inner secondaries with rich chestnut outer webs; tail feathers white, tipped with black; bill and knob at the base bright red; irides brown; legs, toes, and their membranes flesh-pink.”

Measurements.—"Total length 24 to 26 inches, wing 13, tail 5'2, culmen 2'4, tarsus 2." (*Salvadori*.)

Colours of soft parts.—In adults the bills are deep-red, the nail dusky, the irides brown, and the legs and feet flesh-pink to fleshy-red, often more or less creamy on the front of the toes and tarsi.

"Length 23'5 to 25'25 inches, expanse 41 to 46, wing 12'5 to 13'6, tail from vent 4'75 to 5'5, tarsus 2'1 to 2'3, bill from gape 2'2 to 2'4. Weight 2 lbs. to 2 lbs. 14 ozs." (*Hume*.)

Female.—Differs from the male in being less brightly coloured, having no knob at the base of the bill, and in being smaller.

Measurements.—"Length 20'8 to 22 inches, expanse 39 to 42, wing 11'75 to 12'4, tail from vent 4'2 to 4'9, tarsus 1'95 to 2'07, bill from gape 2'1 to 2'2. Weight 2 lbs. to 2 lbs. 2 ozs." (*Hume*.)

Young birds at the age when they arrive in India are duller-coloured than the adults, have the bills a dull brick-red, and the feet livid-fleshy.

Young birds of the year "in August have the bill flesh-coloured, the head and neck brown, chin and front of the neck white, interscapulars brown, wing-coverts white, inner secondaries white, edged with chestnut; primaries black, speculum becoming green, all the under-surface white, legs flesh-colour." (*Yarrell*.)

Nestlings in down "are dark brown above and white below, the white on the underparts extending to the forehead, sides of the head and neck, wings, scapulary region, and sides of the rump." (*Seebohm*.)

Distribution.—During the summer the habitat of this bird extends from the British Isles throughout the whole of Northern Europe as far south as Central Germany and the south of the Caspian Sea in Russia, to South Siberia, Turkestan, Northern China, and Japan. In the winter it ranges south to Northern Africa, South Asia as far as Northern India, South China, Japan and Formosa.

In India it is confined entirely to the northern portion, and even there it is by no means a common visitant, though it is common in Afghanistan and not rare in Baluchistan. Hume gives its southern limit as the twenty-second parallel, and it extends as a rare visitant through Sind, the Punjab and the North-west Provinces, and Oudh. Whitehead, Magrath, Logan and Hume all record it from Kohat.

From Central India it has been recorded by Young, who saw three specimens on a tank about forty miles south of Neemuch in 1891-92. Betham records it from Poona. In Bengal its occurrence is rare; it has been obtained once or twice near Calcutta, and Mr. Finn writes to me:—

"As to the occurrence of the Sheldrake in the Calcutta bazaar, I have seen or got it several times since I came out here in 1894, and only to-day two dead immature birds were brought me. I have seen at least one more this winter from up country."

Hopwood obtained it in Aracan, and recently Kashmir has been added to its habitat, a pair having been twice met with in that locality.

Nidification.—It does not breed with us, but does not go far for the purpose. It breeds extensively in Turkestan, and thence through Russia to our own British coasts, where it is common enough. It has been found breeding as far north as Iceland and Greenland, though not extensively in either country. As a rule, it selects as a site for its nest some deserted burrow—it matters little to what it belongs, or did belong—and places its nest at the bottom. It has been said to live in amity with rabbits, and even badgers, and to have taken to burrows ex-tenanted by foxes, the smell alone of which would have made most ducks require sal volatile in the nest.

Where there are no burrows available, it will place its nest at the bottom of some natural hole or crevice in the shore or amongst the rocks.

They make a good substantial foundation for their nest of grass, reeds, sticks, or any other similar material, and then make a luxurious bed out of their own down, in which their eggs are deposited. In Holland, this down and the eggs form articles of no little commercial value, and special arrangements are made to accommodate the birds and induce them to give their patronage to certain spots. The Sheldrake is fortunately fond of company when undergoing the worries of a family, or the preparations for it. The Dutch therefore select a suitable spot, for choice the natural breeding-place of the duck, and construct neat burrows, slanting at the right angle and wide and deep enough to please the bird, yet not deep enough to baulk their own desires. Left to itself, the bird would as soon build in a fourteen-foot as in a four-foot burrow, but it would be impossible to tackle many of the former, and yet make money out of the collecting of the eggs and down, so the artificial burrows are made of the latter depth. As soon as the eggs are laid the nests are rifled, and the down and eggs taken away, whereupon the ducks once more re-line their nests,

not so well or thoroughly, of course, as they did their first, and lay a second clutch of eggs, which they are allowed to hatch and rear in peace.

I have often been astonished at the pace these heavy birds will fly at when entering their nests if these are placed in a steep sand-bank facing the sea. The ducks plunge headlong in without any hesitation, and never seem to make a mistake; as a rule, however, they select rabbit-burrows on sloping hills facing away from the sea. They are very particular in their choice, and their prints may be seen in and about many burrows besides the one finally selected.

Normally they lay from eight to sixteen eggs, generally ten to twelve, but should the first clutch be taken, they lay another, and in this way the number may reach as much as or more than thirty.

The eggs are a very beautiful pearly-white, extremely smooth and very highly glossed. In shape they are typical ducks' eggs, rather broad as a rule, sometimes lengthened, but never, as far as I have seen, pointed at the small end. Hume says that they are sometimes a pale cream, but such I have never seen. Hartert gives the following measurements for their eggs:—

Average of 100	...	65·77	\times	47·3	mm.
Maxima	...	70·0	\times	47·3	and 69·0 \times 50·0 mm.
Minima	...	61·1	\times	48·0	and 62·8 \times 43·3 mm.

In northern Europe the breeding-season is from the beginning of May to the middle of June, most eggs being laid between the 15th May and 5th of June.

Morris ('British Birds and their Eggs,' iii, p 73) writes:—

"The eggs are ten or twelve or even more, it is said thirteen or fourteen, or even sixteen in number; but these in such cases may have been the produce of two birds. They are nearly perfectly white, having only a very faint tinge of green, and are smooth and shining. They are equally round at both ends.

"The hen bird sits, as is believed, from about twenty-six to thirty days, her mate keeping watch hard by and taking her place in the morning and evening while she picks up some food.

"The young, when hatched, are either carried by their parents in their bills to the water, or soon make their way thither themselves. They hide themselves away at the approach of danger, the old ones, conscious no doubt that they are able thus best to find security, flying off themselves."

General Habits.—This extremely handsome and conspicuous bird, although, one would think, so little likely to be overlooked, and having a wide possible range through Northern India, is yet but seldom met with, and is never, or hardly ever, seen for any length of time in one locality. This, as Hume explains, is probably due to the fact that its natural habitat is not fresh water, but the sea-shore, and the sea-shore where it is clean. Most of our shore is not clean, and very little of it is visited and well-known, so that even the few birds which do haunt it may well escape observation. The rest which make up their minds on India for a winter habitat are compelled to resort to the largest pieces of water they can find which have suitable sandy shores and churs on which they may walk about. They are essentially land and not water ducks, and may be found nine times out of ten strutting about or resting quietly on some sandy bank or shore. When disturbed they do not take to the water and thence to wing, but at once rise into the air, uttering their loud call as they first take the alarm, and once in flight they soon put a long distance between themselves and the cause of their disturbance. They are strong both on the leg and the wing; on the former their actions are decidedly more goose- than duck-like, and they walk well, quickly, and in a very erect attitude. When flying, on the other hand, they approach more nearly the ducks, making less commotion with their wings than do the geese. Their note has been variously described, and is a very similar cry to that of the brahminy duck in the breeding season, but more shrill and high-pitched at other times. Hume calls it a harsh quack, which, he says, might perhaps be called a whistle.

They dive well and swim well, but are loath to take to either expedient, and it is only when severely wounded that they resort to it. As they feed principally in shallow water, their diving is not called into action, though they often retain their heads under water for long periods.

Hume on two occasions noticed birds "washing and sluicing themselves with an energy and persistence that I have rarely seen equalled in any other species." He then, also, noticed that the birds remained with their heads under water quite as long at a stretch as any of the true diving-ducks would have done.

Their food appears to be mainly animal, and consists of shell-fish, water-insects, prawns, and shrimps, and practically all or any of the small animal life found on the shores at low tide or in shallow water. A small amount of vegetable matter is doubtless eaten now and then, but merely as one takes vegetables with a meat diet.

Of course, they are not good to eat ; which of the animal-feeding ducks are ? And Hume says even skinning has no effect. It is certainly not to be expected it would have much, as flavour, unlike beauty, is more than skin-deep, though skinning has with many birds a certain amount of good effect.



THE RUDDY SHELDRAKE or BRAHMINY DUCK.
Casarca ferruginea.

Genus CASARCA.

The genus *Casarca* consists of four species, of which four the widest-spread is the well-known Indian Brahminy. Of the others, *C. cana* is confined to South Africa, *C. variegata* to New Zealand, and *C. tadornoides* to Australia and Tasmania. Of the four, also, the Indian is the only migratory one, the others being local residents or only locally migratory. The bill differs from that of *Tadorna* in being no broader or narrower at the tip than at the base. The lamellæ also are more prominent at the base of the upper mandible, whereas in *Tadorna* they are more developed towards the tip.

Both sexes have a rudimentary spur on the shoulder (carpal joint).

(23) CASARCA FERRUGINEA.

THE RUDDY SHELDRAKE OR BRAHMINY DUCK.

Anas ferruginea, *Pallas, Vroeg's Cat. Adum.* p. 5 (1764), (Tartarei).

Casarca rutila, *Jerdon, B. of I.* iii, p. 791; *Hume, S. F.* i, p. 260; *Adams, ibid.* p. 401; *Hume, Nests & Eggs*, p. 641; *Ball, S. F.* ii, p. 437; *Hume, ibid.* iii, p. 193; *Butler, ibid.* iv, p. 28; *Scully, ibid.* p. 198; *Fairbank, ibid.* p. 264; *Butler, ibid.* v, p. 284; *Hume & Davis, ibid.* vi, p. 489; *Hume, ibid.* viii, p. 115; *Scully, ibid.* p. 362; *Hume & Marsh. Game-B.* iii, p. 123; *Oates, S. F.* x, p. 245; *Salvadori, Cat. B. M.* xxvii, p. 177; *Blanford, Avifauna B. I.* iv, p. 428; *Stuart Baker, J. B. N. H. S.* xi, p. 576; *id. Indian Ducks*, p. 114 (1908); *Betham, J. B. N. H. S.* xix, p. 751 (1909); *Thornhill, ibid.* xxv, p. 439 (1918).

Tadorna casarca, Legge, *B. of C.* pp. 1070, 1222 (appendix); Oates, *B. of B. B.* ii, p. 277; Hume, *Nests & Eggs* (Oates' ed.) iii, p. 280; Hartert, *Vog. Pal.* p. 1303 (1920).

Description. Adult Male.—Whole head and upper part of the neck buff, changing gradually into bright orange-brown at the base of the latter. Scapularies and back, flanks, and whole lower plumage rather bright orange-brown, lower back finely vermiculated black and rufous; upper tail-coverts and tail black; wing-coverts white, quills black; secondaries glossed rich-green on the outer webs, forming a well-defined speculum. Hume says that the speculum may be either bronze or green, but I have personally seen none of the former colour.

Inner secondaries light-buff, more or less tinged with rufous on the outer web, and principally grey on the inner; axillaries and under wing-coverts white.

In the breeding-season there is a black collar at the base of the neck, usually very indistinct in Indian birds, and often absent.

Colours of soft parts.—Bill and feet black, irides rich-brown.

Measurements.—“Length 24·5 to 27·0 inches, expanse 48·0 to 52·5, wing 14·25 to 15·5, tail from vent 5·4 to 6·3, tarsus 2·3 to 2·7; bill from gape 2·2 to 2·24. Weight 3 lb. to 4 lb. 4 ozs.” (Hume.)

In the cold weather the majority of the drakes have their white wing-coverts much suffused with rufous. Hume had specimens practically having their wing-coverts and lower plumage concolorous.

Adult Female.—Differs in being smaller, and in having the head paler and “in having (at any rate, during the cold season) the whole anterior portion of the head white.” (Hume.) The black collar is never assumed.

Measurements.—“Length 21·75 to 24·0 inches, expanse 42·5 to 47·75, wing 12·36 to 14·0, tail from vent 5·06 to 6·0, tarsus 2·12 to 2·4, bill from gape 2·0 to 2·3. Weight 2 lb. 1 oz. to 3 lb. 5 ozs.” (Hume.)

Young of the First Season.—Generally like the female but rather duller, the scapulars and upper part vermiculated brown and pale-rufous; the inner secondaries brown, more or less vermiculated with reddish-buff, more especially on the inner web; tail with narrow obsolete bars of rufous and distinctly tipped with the same.

In India many birds are met with in their transition stage between this and the fully adult plumage. I have now a fine young male before me with adult scapulars, but the back shows fine vermiculations of brown, the tail and inner secondaries are those of the young bird, and the whole lower plumage has the feathers very faintly and indistinctly tipped paler.

In this bird the feet are purplish-black, irides bright-brown, and bill slaty-black.

Nestling.—“A nestling brought from Tso-mourari is mostly white, marked on the upper surface with blackish brown, and with here and there a fulvous tinge.” (Hume.)

Distribution.—The Brahminy is not a bird of very northern latitudes, even during the breeding-season. In summer it is found in Spain, though in small numbers only, throughout Southern Europe and Northern Africa, and thence through Asia Minor, Turkestan, Afghanistan, and extreme Northern India at altitudes over 10,000 feet, through China in the north, and Japan. It has been recorded from nearly all North European countries, including Great Britain, but nowhere as anything but rare. In 1892, Messrs. Pearson recorded it from Iceland in the 'Ibis' for 1895, p. 247, and in the same year it was recorded as having been seen in 1892 even further north than this, viz., in the Upernivik district of Western Greenland, by Dr. Van Höffen, who was naturalist to the Drygalski Expedition in 1892-93.

In winter it resorts to the plains of India, Northern Burma, South China and Japan, and Formosa. In India the only places from which it has not been recorded are such as do not afford sufficient water, and it is practically unknown in the waterless tracts of portions of Sind and Rajputana. From as far south as Ceylon it is noted as not uncommon. Legge, in the appendix to the 'Birds of Ceylon,' says:—

"This Sheldrake can no longer be relegated to the doubtful or unprocured species in the Ceylon lists. Mr. G. Simpson, of the Indian Telegraph Department, has lately sent a portion of the skin of a male shot by him in the Jaffna district to Mr. Parker for identification. He likewise furnishes a description of the bird, which has been forwarded to me, and there is no doubt about the matter. The wing of the example in question measures 14·75 inches. Mr. Simpson says they are not uncommon in the cool season on the Jaffna Lake near Pooneryn, and on the Delft, Palverainkadoo and Mullaittivu lagoons. They are, he finds, very wary, flying high when disturbed, and uttering a note like *conk, conk*."

To Southern Burma it is a very rare straggler, and I can find none but anonymous records of its occurrence there, but in Aracan, Hopwood says, it is found in enormous numbers.

Oates observes (*in loc. cit.*) :—

"The Brahminy Duck is a visitor to the Province from October to March. It is very abundant in the large rivers of Pegu; but Mr. Davidson did not observe it in Tennasserim."

Like Mr. Inglis, I have found the Ruddy Sheldrake a rare bird

in Cachar, and not common in East Sylhet, where the rivers are too muddy, and are wanting in suitable sandy banks and churs. In South and West Sylhet it is much more common, for there the rivers begin to widen out into fine clear streams.

In Orissa it is not uncommon to find this bird on the salt back-waters and pools, and even on the shore itself. It is very common on the Chilka Lake, and I have seen it on the brackish tidal waters of the Sunderbands.

Except in mid-winter, it is to be met with in considerable numbers in the lofty valleys of the Himalayan rivers, in Kashmir, and at other equally lofty elevations, and from thence down to the level of the plains. In Kashmir it appears to be met with more or less throughout the cold season, but, probably, deserts the higher valleys of the Himalayas during the coldest period.

Nidification.—The Ruddy Sheldrake, though a migrant to the plains of India, is yet amongst the few ducks which breed within our limits, as it frequents many of the lofty valleys of the Himalayas for this purpose. It has not been found to breed there below 10,000 feet, and Hume says its nest has been taken as high as 16,000 feet.

In Mesopotamia, Tomlinson and Thornhill record its breeding in burrows in banks of the Tigris and in low sand-hills. The latter records one taken from a deserted jackal's burrow twenty feet in.

In Southern Russia, Asia Minor, and Central Asia, the normal site chosen by this duck is either the deserted burrow of some animal, or a natural crevice or hole in a mountain side or bank, sometimes on level ground. In the Himalayas, the Brahminy breeds, more or less, in company, though the nests may be some distance apart. They are here generally placed in holes or crevices in the high cliffs overhanging streams or lakes, generally close to, but at other times some distance from, them. The nest-holes are often at very great heights from the ground, and as the nestlings have been seen on the water when very young indeed, it follows of necessity that they are taken there by their parents.

The Ladakhis say that they are carried in the feet ; and this, I think, must be the case, though Hume, on the contrary, considers

it more likely that they are carried on the backs of the old birds, his argument is that the feet are not adapted to grasping; but if a strong adult bird could not grasp with sufficient strength to hold up a nestling, how could the same nestling have sufficient grasping-power to maintain its position on the old bird's back during flight?

Occasionally it breeds in very remarkable situations. Hume says that they "lay in holes in trees and even fallen logs, and in deserted nests of birds of prey." Tristram found it breeding in a cliff in Northern Galilee amongst griffon vultures in May, and in the Eastern Atlas associating with the raven, the black kite, and the Egyptian vulture.

"So too, in Ladakh, its nests have been found associated with one of the Thibetan raven."

He also quotes Prjevalsky as follows:—

"They build in holes and clefts in the ground, and sometimes even in the fire-places of the villages deserted by the Moguls, in the latter places the females, while hatching, get almost black with soot."

Betham gives a most interesting account of two nests taken by Captain Shuttleworth in Chinese Turkestan in April, 1909, both placed in holes in big trees. Two curious points about the second find were that on the same tree was a merlin's nest, and secondly that the tree itself was eight miles from the nearest water. This latter fact would seem to make the carriage of the young by their parents an absolute necessity.

Then again, Messrs. Elwes and Buckley say that in the Dobrudscha the bird sometimes lays its eggs in a hole in the centre of the cornfield, where naturally they are not easy to find.

The nest itself seems to be much like that of the common sheldrake, a mass of twigs, etc., lined with down; sometimes, however, it is found to consist almost entirely of down and feathers, and altogether it appears to be less bulky and to have few materials other than those just mentioned. Strange to say, I can find no record anywhere of the depth of hole most often resorted to for nesting purposes, but, from what has been written, it would seem to matter little to the bird how deep or shallow it was, provided the situation proved convenient.

Within our limits, and probably everywhere else also, the birds commence to lay in May, and nestlings just hatched have been seen and procured well on into July in India, Tibet, Ladakh, and even in Southern Russia.

Different writers give the number of eggs laid as varying between six and ten, but eight appears to be the number most frequently laid. Eggs sent to Hume from South Russia are described by him as being moderately broad ovals, slightly pointed at one end. The colour is said to be a creamy- or ivory-white, with the shells very smooth and comparatively thin.

They vary in length between 2·4 and 2·7 inches, and in breadth from 1·7 to 1·9, but, as he says, a larger series would probably show a wider range of difference.

My eggs agree with the above in every respect, including those I have had sent me from Tibet.

General Habits.—Hume says :—

“They arrive in flocks, and before leaving in April gather again into these, but during the winter they are almost invariably seen in pairs. Often several pairs may be seen congregating in the same place, but even then each pair separates on any alarm and acts on its own behalf, and without reference to the others.”

In Bengal, and further south probably, few people see them in flocks, even when they arrive or when about to depart, as the flocks seem to break up soon after their arrival in Northern India, and the pairs then make their way to their final destination, free from the influence of the birds they started with. In Northern India the first few birds arrive as early as—perhaps even earlier than—the end of September, and then work slowly south, arriving in Central India and the adjoining provinces at least a month later; nor are they common in Bengal until early November. In Southern India they are rare before the end of that month. The latter part of the country they leave again in the end of February and early in March; by the middle of that month nearly all have left Lower Bengal, the Central Provinces, and Central Bombay, and by the beginning of April they are just thinning in Northern India, and most have gone before May sets in. They have been, of course, recorded throughout that month, and even in Bengal I once saw a pair in the end of April, but these cases are, I think, but examples of the exceptions that prove the rule.

The Brahminy is not an object of sport with Europeans, save for those whose motto is "kill what, when, and where you can"; this principally because, even when divested of its tough and greasy skin, he is not worth eating, unless with an extra dose of the hunger-sauce. He is, however, well worth while to shoot, or try to shoot, if you are not an old hand at duck-shooting, for by the time you have learnt to circumvent and bring to bag "Chakwa and Chakwi" you may rest satisfied that you have learnt most of the arts necessary to render stalking ducks and geese a successful pastime. They are, as is almost universally admitted, the most cute and difficult of approach of all their tribe. Possibly the crow alone exceeds them in their aptness for learning the range of a gun: they will nearly always allow of an approach of within two hundred yards, often within one hundred and fifty yards, and this with such a devil-may-care unconcerned look about them that one would imagine a closer approach to be an act of very little difficulty. Anyone who attempts to work on this presumption will soon find out their error. Should the stalk be made with some, yet insufficient, care, the Brahminy will allow you to come a few yards further, and then leave for another and better land (or water). On the other hand, should the stalker be so careful as to keep well enough hidden to entirely evade the watchful eye, he is not allowed to approach any nearer at all, but is given the benefit of the doubt, and all he will find of the bird when he arrives will be the impression of his feet in the sand.

Practice may sometimes be had on the larger rivers, where they are plentiful, with one of the modern small-bore rifles, with which one ought to be able to kill at two hundred yards; very soon, however, they learn to fix the range even of these weapons, and new ground will have to be sought for, for future shooting. Hume, writing of this form of shooting the Brahminy, says:—

"After being at this game for a few days, and killing five or six, not a Brahminy in the neighbourhood will let you approach within a quarter of a mile, and thenceforth they give you so wide a berth that they interfere very little with fowling."

It is decidedly a bird of clean, clear water predilections, and may generally be found in the larger rivers on the wide sand-churs which form each cold weather as the water sinks. They like such as are

clean stretches of sand, devoid, or almost devoid, of vegetation, and they keep much to the land, though not so exclusively to it as the common sheldrake. Of course, where there are no rivers, the Brahminy does not disdain any ordinary lake or large piece of water, but he eschews such as have much jungle about them and have their shores all more or less clothed with the same, or with growing crops, unless the latter are very young and short. Small dirty ponds and weedy tanks he will have nothing to do with, except when in the direst distress, nor will he willingly frequent small nullahs and rivers with muddy banks. Even when there are fine open pieces of water he will always leave these and resort in preference to sandy tanks and churs, should such be in the vicinity, though he may visit the former now and then to feed.

The bird has been frequently tamed, and becomes very domesticated. Some writers, Hume amongst them, speak well of its character under such circumstances, and say that it is gentle and forbearing to other ducks which may be sharing its captivity. Mr. Finn, however, says that, from what he knows of it, "it is by no means the gentle and inoffensive bird in captivity that Hume makes it out to be, but is decidedly ill-conditioned and given to persecuting other water-fowl."

Everyone knows the legend about the Brahminy which is held by the natives to account for only two birds being found together. They are supposed to be inhabited by the souls of lovers who have sinned. Once, two lovers, who were prevented from marriage by their parents, determined to take the matter into their own hands, and risk the displeasure of the gods. Eventually, the lady escaped from supervision, and went straight to her lover, who was awaiting her; but they enjoyed their liberty only for twenty-four hours, for the next night they were changed into Brahminy Ducks, and were condemned ever to keep on opposite sides of the stream, and though they were allowed to speak to one another, and to ask if they might come, the other was forced ever to reply in the negative. Hume ridicules the legend, and says he has never met a native who had heard of it; all I can say is that I have, repeatedly.

At night, when feeding, the birds will often wander far apart, and may be heard calling to one another in their short dissyllabic

notes, which are rendered by the natives into "Chakwi, shall I come?" "No, Chakwa!" and then "Chakwa, shall I come?" with the reply, "No, Chakwi!"

The Hindustani words for these questions and answers are not at all unlike their notes, which are loud and resonant, far more goose- than duck-like in their character. Elliott, Pallas, Jerdon, &c., syllabise it as á-oung, others as conk, conk; perhaps a combination of these two into á-onk, gives as good an idea of the note as any other accumulation of letters.

They are good swimmers as well as quick and agile divers, but do not seem to be able to keep under water long, nor do they appear to ever attempt to conceal themselves under water. On the wing they are decidedly strong, but are noisy risers, though not slow ones. The movements of their wings are less rapid than in the majority of the *Anatidæ*, and give one the impression that their progress is far slower than it really is. They are good walkers, and though generally their movements are marked more by dignity and deliberation than haste, they are capable of very good performances as pedestrians. Their attitudes on land are more those of geese than of ducks.

They are not at all shy birds, nor are they at all wild in the ordinary acceptation of the word. They object to anyone coming within shot, but when outside that distance seem to have nothing to say against being watched and remarked upon. I was introduced to Chakwa and Chakwi in the Santhal Parganas a very short time after I came to India. At the time I was engaged in camping across the district, and, generally riding ahead of my belongings, would arrive at the next camping-ground some hours before they came up. One of these grounds was on, or close to, the sandy bank of a river, and of course the interval between arrival and breakfast was filled up by strolling about.

Two Brahminy Ducks soon attracted my attention, and though I was within about one hundred and fifty yards they took no notice of me, but stood on one leg basking in the sun, and now and then uttering a single low conk, not a note of alarm, but one which seemed to me, at the time, to be of overweening pride and misplaced confidence. Later on, I found out where these qualities should have been looked for. I strolled back to camp, the birds still ejecting

their cries at me as I went my way. A gun obtained, I strolled back and was greeted by the birds with the same ejaculation. Then I prepared to stalk, and waiting until the birds were not looking, sank out of sight into some stubble; the Brahminies got up and flew off.

The next pair I came across spotted me just as I got through the first half of a stalk, and the third must have seen me all the time, getting on the wing when I was still twenty or thirty yards too far to shoot.

Hume gives a most excellent example of their fearlessness under what they consider proper circumstances:—

“At Allahabad, at the sacred juncture of the Jumna and the Ganges, I noticed during a great fair, which is held on a spit of sand at whose apex the rivers meet, two pairs of these ducks, placidly performing their own ablutions, just opposite where some 200,000 people, densely packed, were bathing. The hum, the roar, I should say, of the mighty multitude sounded a mile off like the surge of wind and waves in stormy weather on a rock-bound coast. Scores of boats conveying the richest pilgrims to a shallow of special sanctity, a hundred yards below the point, were ceaselessly plying backwards and forwards, crowded and crammed with human beings. Hundreds of gaudy flags were fluttering from the topmost points of gigantic bamboos, planted near the water’s edge, yet, totally regardless of sounds and sights that might have startled the boldest bird, the old Brahminies dawdled about the opposing bank of the Ganges, distant barely 500 yards from the clamorous struggling rainbow-coloured mass, as though the vagaries were no concern of theirs, and signified no more than a convocation of ants.”

They are very omnivorous, and will take almost anything they can get, including fish, flesh, and all sorts of grain, water-weeds, seed, and growing crops, in which they are sometimes found grazing like geese. There can be little doubt also that they sometimes fall so low as to take to offal.

Their flesh is distinctly bad, on a par with that of the whistler and the cotton-teal at their worst, and little better than that of the white-eye or shoveller.

Genus ANAS.

This genus contains seventeen species, some of which are practically cosmopolitan, and others confined to comparatively small areas. India possesses but two species—*Anas platyrhyncha* and *A. pæcilorhyncha*, which is divided into three subspecies, *A. p. pæcilorhyncha*, *A. p. zonorhyncha*, and *A. p. haringtoni*; the first species is cosmopolitan, whereas the other belongs to the Eastern and South-eastern Asiatic avifauna.

The genus may be recognised by its broad but not spatulate bill, which is about the length of the head; moderate tail, of which the central feathers are not lengthened; its non-chestnut inner secondaries and dark grey coverts.

Key to Species and Subspecies.

- A. No white on outer webs of inner secondaries . . . *A. platyrhyncha*.
- B. Outer webs of inner secondaries more or less white *A. pæcilorhyncha*.
 - a. A broad white band posterior to the speculum.
 - a'. A red spot at base of bill on either side . . . *A. p. pæcilorhyncha*.
 - b'. No red spot at base of bill *A. p. haringtoni*.
 - b. No white band posterior to the speculum . . . *A. p. zonorhyncha*.

(24) ANAS PLATYRHYNCHA.

THE COMMON WILD DUCK OR MALLARD.

Anas platyrhynchos, *Linn. S. N. x. ed.*, 1, p. 125 (1758) (Sweden).

Anas boschas, *Jerdon, B. of I.* iii, p. 398; *Hume, Nests and Eggs*, p. 642; *id. S. F. i.*, p. 261; *Scully, ibid. iv*, p. 199; *Hume, ibid. viii*, p. 119; *id. Cat. No. 158*; *Barnes, B. of Bom.* p. 402.

Anas boscas, *Hume & Marsh. Game-B.* iii, p. 151; *Hume, Nests and Eggs* (Oates' ed.), iii, p. 288; *Salvadori, Cat. B. M.* xxvii, p. 189; *Blanford, Avifauna B. I.* iv, p. 435; *Oates, Game-B.* ii, p. 257; *Stuart Baker, J. B. N. H. S.* xii, p. 1; *Harrington, ibid. xix*, p. 313 (1909); *Mosse, ibid. xx*, p. 856 (1911); *Higgins, ibid. xxii*, p. 399 (1913); *Colvin, ibid. xxvi*, p. 291 (1918).

Anas platyrhyncha platyrhyncha, *Hartert, Vog. Pal.* p. 1308 (1920).

Description. Adult Male.—Head and upper neck bright and very glossy dark-green; a ring round neck, interrupted on the nape, pure white; upper back and scapulars brownish-grey, changing into dark-brown on the back and lower neck; upper back vermiculated with dark-brown; rump and upper tail-coverts and four central rectrices deep-black; outer rectrices light-grey, edged white. Wing-coverts dark-grey or grey-brown, the greater coverts tipped black and subtipped white, forming two distinct wing-bars; speculum glossy bluish-purple or violet; after this two bars formed by the black subtips and white tips of the outer secondaries; exposed inner secondaries and remaining quills dark-brown; upper breast chestnut; lower breast, flanks, and abdomen greyish-white, very finely barred with dark-brown; under tail-coverts rich black.

Colours of soft parts.—“The colours of the soft parts vary. I have found the legs and feet most commonly reddish-orange, but also coral and vermillion red, and again pure orange, the claws are black or dusky; the irides are brown, sometimes deep, sometimes comparatively light; the nail of the bill is black; the rest of the bill is normally rather dingy olive, more yellow at base, greener at tip; the lower mandible is generally more or less orange at the base; and I have killed birds (females) with the bills black on the culmen and a considerable portion of the upper mandible and orange-yellow elsewhere; others with brown replacing the black, and brownish-yellow replacing the orange; and I killed one male with the bill a distinct orange-green—a colour such as I never saw in any other bird.” (*Hume*.)

“Bill yellowish-green, black at the tip; under mandible reddish-yellow at the base; irides brown; legs and feet reddish-orange.” (*Salvadori*.)



THE COMMON WILD-DUCK OR MALLARD.
Anas platyrhyncha.

female.

$\frac{1}{3}$ nat. size.

male.

Measurements.—“Length 22·3 to 24·5 inches, wing 10·45 to 11·3, tail from vent 4·2 to 4·8, tarsus 1·6 to 1·85, bill from gape 2·5 to 2·75. Weight if in fair condition 2 lbs. 8 ozs. to 3 lbs., but I have shot them up to 4 lbs.” (Hume.)

“Total length about 24 inches, wing 10·50 to 11·50, tail 4·4, culmen 2·2, tarsus 1·85.” (Salvadori.)

Female.—Chin and throat pale-buff; remainder of upper and lower parts dark-brown with buff edges; on the lower parts the brown centres are reduced to streaks only; rectrices brown, edged with pale-buff; wings as in the male.

The depth of the brown and its tint vary very much, as does the boldness of the edging. In some birds the centres and edges blend into one another, whilst in others they contrast very distinctly.

Measurements.—Length 20·0 to 21·75 inches, wing 9·2 to 10·8, tail from vent 4·1 to 4·7, tarsus 1·5 to 1·7, bill from gape 2·47 to 2·63. Weight 1 lb. 10 ozs. to 2 lbs. 10 ozs.

Adult Male in non-breeding Plumage.—Similar to the female, but usually a good deal blacker.

Young in first Plumage.—“Closely resembles adult female, but the male is somewhat darker in colour.” (Salvadori.)

Young in Down “has the upper parts dark-brown, with nearly white spots on the wing, scapulars, and sides of the rump; the underparts are pale brown, palest on the belly, and shading into buff on the throat; it has a buff stripe over the eye, a dark-brown stripe through the eye, and a dark spot at the end of the ear-coverts.” (Seehoem.)

Waterton, as quoted by Hume, describing the change of plumage in the drake into its post-nuptial plumage, says:—

“At the close of the breeding-season the drake undergoes a very remarkable change of plumage. About the 24th May the breast and back of the drake exhibit the first appearance of a change of colour. In a few days after this the curled feathers above the tail drop out, and grey feathers begin to appear amongst the lovely green plumage which surrounds the eyes. Every succeeding day now brings marks of rapid change. By the 23rd June scarce one single green feather is to be seen on the head and neck of the bird. By the 6th of July, every feather of the former brilliant plumage has disappeared, and the male has received a garb like that of the female, though of a somewhat darker tint. In the early part of August this new plumage begins to drop off gradually; and by the 10th October, the drake will appear again in all its rich magnificence of dress.”

Distribution.—Hartert gives the range of the Mallard as Europe, the Azores, North Africa, North and Central Asia to Japan and North America, migrating in winter to the Canaries, Abyssinia, Aden, India

and South China, and in America to Mexico and Panama. Sub-species are found in Greenland and Iceland.

Narrowing ourselves to our Indian limits, we find that *A. platyrhyncha* is very common only in the extreme North and North-west; it is a constant but less numerous visitor to the whole of the North-west Provinces, Punjab, and Oudh; and south of this is decidedly rare, though in 1910-11 Mosse reports its having occurred in some numbers in Western Kathiawar. It has been shot occasionally in Rajputana, and also in the Central Provinces and in Bombay.¹ It is met with at odd times and places throughout Bengal and Assam, and I myself have shot a pair in Jessore which were in company with a few Gadwall. They were extremely wild, as were all the ducks, and it was only with considerable difficulty that they were approached and shot. It is not rare in Cachar, and is occasionally to be seen in Sylhet. I shot one out of a small flock in Gowhatta in December, 1886, and many were shot in the same district by Mr. C. Holder and others; and I have had notices of it from Dibrugarh (frequently), Sadya, Tezpur, and Naogaon. From Manipur Surgeon-Captain Woods writes:—

"The Mallard is extremely rare in Manipur; in fact, during the last seven years I have only seen a pair, and that was this year about the 10th January. These two birds were along with a large flock of teal in a small jheel lying about 8 miles due north of Imphal. I tried to secure them, but they were very wild, and flew away at the first shot. I returned to the jheel the next day, but could find no signs of them. I also saw a pair on a small jheel in the Namba Forest (Assam)."

Higgins, however, reports the shooting of three more Mallard in the cold weather of 1912-13. Lately two records of its appearance in Burma have been made in the 'Asian.' The notices, though initialled and not signed in full, appear to be authentic. One Mallard is reported as being part of a huge bag of duck and teal obtained near Mandalay. Harington records it as having been shot in the Bhamo district.

Nidification.—Within Indian limits, the Mallard breeds in vast

¹ Colonel A. S. Capper informs me that on Christmas Day, 1920, a Mallard was shot near Guna by Mr. Wansbrough-Jones. This appears to be its second recorded occurrence in the Central India agency.

numbers on the Kashmir lakes, and in small numbers on those in Tibet, probably also throughout the Himalayas in suitable places. Hume suggests that it may also be found to breed on swamps about the foot of these mountains; but I can find no record of its ever having done so.

As far as we know, Kashmir is the breeding-place *par excellence* of our Indian Mallards; here they are found in such great numbers that their eggs form a veritable article of commerce, boat-loads at a time being collected on the shores of those lakes which they principally affect for breeding purposes.

The nest is a massive affair, composed of all and any materials, but principally of grasses, rushes, reeds and similar articles.

The lining of feathers and down varies very much. I have seen a nest into which one could plunge a hand to the wrist into down and feathers; and, again, I have seen others which had not a handful of these in the whole nest.

The normal position of the nest is on the ground in thick cover; often it is placed in amongst the dense sedges, reeds, and bushes growing at the edge of the water; but at other times it is placed at some distance from the water, and at other times, again, absolutely in the water itself, amongst some thick cluster of reeds or other aquatic plants.

The nest is not always, however, placed on the ground. In India the natives say that they sometimes find the eggs in nests on trees; but there seems to be no authentic record of one ever having been so found. In England, there are numerous records of such nests, and two have come within my own personal experience. One of these was a huge construction of grass and reeds placed in the head of a pollard willow. There was a deep indentation where the nest was placed, and the masses of twigs, then in thick foliage, quite concealed the nest from anyone on the ground. The duck was, however, seen going in, and the nest spotted in consequence. It contained eight eggs, which were, I believe, all hatched and the ducklings reared in safety.

The second nest was quite different. A huge tree (I forget now what it was), which divided into three quite close to the ground, threw out great horizontal limbs over a piece of water which lay

still and dark and very deep beneath the shade of this and many other trees equally big and densely-foliaged. At the end of one of these boughs, and in a most perilous position, on a few small twigs and branches, was the deserted nest of a magpie. Although knocked out of shape, it still formed a strong platform of sticks and twigs, on which the duck placed a little down and a few feathers, and laid her eggs. My brothers and I were small boys at the time, and, of course, with the usual curiosity of small boys, paid constant visits to the nest, not in the least resented—as far as we could tell—by the duck, which never quitted it or showed any signs of fear at our presence. The drake was far wilder, and seldom let us get a view of him. As a rule, he was swimming quietly about in the pond below, whilst his mate was employed in incubation ; but more than once we frightened him from the tree itself, where he must have been perched on one of the big boughs.

The duck, we noticed, always got on one of the big boughs, and then fluttered and scrambled awkwardly into the nest. We got one egg out of the water, into which she must have knocked it ; but she hatched some of the eggs, and we once or twice got a glimpse of the ducklings on the water.

Another curious nest I took was in Warwickshire, and was originally that of a coot, of whose eggs two still remained in the nest. It was placed in amongst the roots of a large tree standing at the edge of a large piece of water, and partly in it. It consisted of a huge mass of weeds and grass and the usual lining of down, but in spite of its size was quite invisible from anywhere.

The previous year the coot had been seen swimming to it, and the year the duck took possession, she must have again laid two of her eggs, and then been driven away by the Mallards ; these latter had eight eggs, hard-set, but not so much so as the two coot's eggs, which were on the point of hatching ; they were under the duck's eggs, and had evidently been laid first.

There are many other instances of Mallards taking other birds' nests, amongst them one in which they seized the lofty abode of a rook.

In Kashmir they are said sometimes to breed in the rice-fields.

On leaving her nest, the duck is said to frequently cover her eggs

with weeds and grasses to screen them from observation. This is, however, probably the exception, and not the rule. I have seen eggs so covered, but far more often I have found them without any additional covering at all. If hurried, the bird has not the time, of course, to collect the necessary material, but even when leaving the nest deliberately, and not disturbed in any way, I think she generally leaves her eggs as they lie.

They lay from six to twelve eggs, the natives say sixteen. I have never seen more than eleven, and Hume, who through his collectors must have had records of many hundreds of nests, never knew of more than eleven, so that anything above this number would appear to be abnormal.

In colour, the eggs when first laid are of various tints, ranging from a very pale greyish-green to olive-grey and café-au-lait. As incubation proceeds, the colour continues to deepen, and the green tinge, which is the most prevalent colour in the fresh egg, is nearly always lost. I had one egg in my collection which was a deep buff-colour; it was found in East Prussia, and I cannot say how far advanced incubation was when the egg was taken, but, judging from the size of the blow-hole, the chick could not have been very large.

The texture is very fine, smooth, close, and satiny to the touch, like that of most ducks' eggs. There is a faint gloss, sometimes rather pronounced in the fresh egg, often absent in those near hatching.

They are normally shaped ducks' eggs, i.e. rather broad regular ovals, sometimes slightly compressed towards the smaller end, sometimes equal at both ends.

My eggs, and those I have records of, all come within Hume's measurements, in length varying between 2·1 and 2·38 inches, and in breadth 1·5 and 1·2.

Hartert gives the average of 270 eggs as 56·3 × 40·9 mm. (= 2·22 × 1·60 inches).

In Kashmir Mallard are extremely common, as may be seen from the following well-written cutting from the 'Asian' of the 8th February, by the pen of A. E. W.:—

"On January 18th, I was shooting at a marsh near the big reserve, having in front of me about five or six acres of open water, and a smaller amount, about 500 yards, behind. The reserve was

also being shot by four guns, so that the ducks were being continually driven towards me. I knew if I could once get my punt through the ice I should be in for a good thing. For an hour and a half we laboured to get through. By dint of using two heavy poles we reached the place, and then broke up sufficient of the ice to picket out four decoy ducks, two mallards, and five tame ducks, which were accustomed to be shot over. The punt was hidden by some grass, and in it I lay on my back with my shoulders propped up by a large sack of grass; there was not sufficient cover to enable me to hide if I had sat up, in fact I had to supplement the little there was by some reeds which a fisherman took off his roof and sold to me.

"I could see thousands of ducks in front, on the water, looking like a black mass, whilst the edge of the ice was lined with many more. By the aid of glasses I could make them out to be chiefly Mallards and Red-Crested Pochards; of course those birds which had been behind and tolerably close had cleared off. The second punt was sent back by the way we came, and was then carried round by land to where the open water touched the edge of the marsh. In the middle of the pond in front, was a small island; on to this a hardy duck shikari managed to get, and then lay hid; his orders were to hide, and when the ducks had settled to put them up. In addition to the advantage of my post, I was immediately in the line of flight between the Hokasai and Anchur Lake.

"I had started early; the Hokasai party were to begin at noon, but I had not been long in position before the fun began. Thousands streamed over, and many pitched on my marsh, but as they came to the right I could not do much when reclining on my back; soon they began to fly backwards and forwards over my head, and this they continued to do for hours. I counted over eighty birds down before I sat up to eat my lunch. They were on the ice in every direction; two or three fell so close that I could gather them from the boat. One fell into my cartridge-box. Whilst eating and having a smoke the birds were flying around, but were left to their own ways; and then I lay down again, the ice had thawed in places, and the wounded birds had wandered away. I stopped all I could reach, but that was not many. In the afternoon the Teal began to fly round and looked for open water, but none of the big flights would come near me. Single birds came at short intervals; my cartridges were nearly finished, so I whistled for the men, but they could not hear me; the shooting on Hokasai ceased, and nearly all the ducks left, now and again a Mallard or Gadwall came flying round the decoys, and fell an easy prey to the . . . powder.

"My men did not remember how long it would take to reach me; consequently it was nearly dark before I could begin to move, and

then the birds had to be gathered. We collected in all ninety-six, but had to leave many, for they waddled over the ice and got into pools separated from us by thick ice and weeds frozen hard together. Curiously enough not a single Red-Crested Pochard came to the gun; but fifty-three Mallard were amongst the slain, and very grand they looked when put in a line on the deck of the house-boat."

In Sind, in the cold weather of course, the Mallard is found in as great numbers as in Kashmir. Here it is said to collect in flocks of some hundreds; but this is not usual, and all over its vast range it will be found more often in small than in large flocks. About a dozen to some twenty or so is perhaps the number most often seen together in one flock, and over forty or fifty is well above the average, whilst flights numbering 100 will seldom be seen.

They often, too, are found in pairs, whether in the hot plains of India or in our own cool island. Many, if not most, of us must have, while wandering about some half-frozen brook or wholly-frozen broad, put up a pair of Wild Duck from some sheltered place beneath a tree or thick cluster of reeds. Generally, even in the depth of winter, they keep to open water, be it a pool ever so small; but they may also be seen disconsolately sitting at the edge of a completely ice-bound pond.

As regards their habits generally, it is impossible to do better than follow Hume and quote what Macgillivray says:—

“ Marshy places, the margins of lakes, pools, and rivers, as well as brooks, rills, and ditches, are its principal places of resort at all seasons.

“ It walks with ease, even runs with considerable speed, swims, and on occasion dives, although not in search of food. Seeds of Gramineae and other plants, fleshy and fibrous roots, worms, mollusca, insects, small reptiles and fishes, are the principal objects of its search. In shallow water it reaches the bottom with its bill, keeping the hind part of the body erect by a continual motion of the feet. On the water it sits rather lightly, with the tail considerably inclined upwards; when searching under the surface it keeps the tail flat on the water, and when paddling at the bottom, with its hind part up, it directs the tail backwards. The male emits a low and rather soft cry between a croak and a murmur, and the female a louder and clearer jabber. Both, on being alarmed, and especially in flying off, quack; but the quack of the female is much the louder. When feeding they are silent, but when satiated they

often amuse themselves with various jabberings, swim about, approach each other, move their heads backwards and forwards, 'duck' in the water, throwing it up over their backs, shoot along its surface, half flying, half running, and in short are quite playful when in good humour. On being surprised or alarmed when on shore, or on water, they spring up at once with a bound, and rise obliquely to a considerable height, and fly off with speed, their hard-quilled wings whistling against the air. When in full flight, their velocity is great, being probably 100 miles an hour. Like other ducks, they impel themselves by quickly repeated flaps without sailings or undulations."

Probably some of us will not agree with what Hume says regarding the comparative merits of a punt-gun when he declares that "there is more skill, knowledge, and endurance brought into play, and therefore more sport, in one day's big shooting, than in a week of even such small-bore shooting as Captain Butler describes." I have had a little experience of both, and must most emphatically dissent. Of course, a punt-gun, especially one of the latest swivel-action, breech-loading, non-recoil guns, will enable a sportsman to bring birds to bag that he could not otherwise get; but it is not that he uses more skill in approaching, but that there is not the need to get so close. He does not require a more careful aim, for he nearly always takes his shot into the brown as the birds lie on the water. Nor does he require more endurance. To this most people will agree who have stood behind some 200 shots fired from a 12-bore carrying a really heavy charge. Certainly getting some one to push you along in a punt cannot be said to require more work than does the tramping after your birds on foot.

Mallard especially are strong flyers, and I would personally always feel more satisfaction on hearing the thud, thud, of a brace of birds on the ground in answer to the two barrels of my 12-bore than I would in seeing five, or even ten times that number, left on the water as the result of a lucky shot from a punt-gun.

In shooting Wild Duck as they rise before one, it is as well to loose off one's piece as soon as possible, for, as Macgillivray says:—

"They rise straight up in the air whether flushed from land or water, and whilst thus rising offer what is perhaps the easiest shot, and at the same time they are not increasing their distance."

Mallard have queer fancies, and often resort to places where one would least expect them. I well remember a drake which used to come year after year to a tiny pond in a large private garden, where there were few or no weeds on the water; but it was entirely enclosed by trees and in a very deep shade. As soon as the breeding-season was on he used to go off, presumably to carry on his natural duties as a husband and a father, but he never brought back with him either wife or family. There were sometimes tame ducks about the place, but he never seemed to care to associate with them, and kept them always at a respectable distance. What rendered it more curious that he should have chosen such a place was the fact that the garden was in the county of Norfolk, and was surrounded by the famous broads and fens, where he might have obtained the society of any number of his own kind.

Yet another pair used to resort every winter to a small pond joined to a moat which ran round an old monastery. These were never seen on the moat itself, nor on any of the numerous ponds close to it, but when disturbed—they seldom were—used to fly straight away, not to return for some days.

Colvin records a curious habit of this duck. Writing from Bandar Abbas, he says that during February and early March, 1918, he constantly noticed them settling on the sea close in-shore, the flocks remaining there from morning to evening. The birds seemed to take little notice of the work of loading and unloading ships close by, but they were very wary, and would not allow of an approach within gun-shot.

(25) *ANAS PŒCILORHYNCHA PŒCILORHYNCHA.*

THE SPOT-BILL OR GREY DUCK.

Anas pœcilorhyncha, *Jerdon*, *B. of I.* iii, p. 799; *Hume*, *S. F.* i, p. 261; *Adam*, *ibid.* p. 402; *Hume & Davis*, *ibid.* iv, p. 489; *Hume*, *ibid.* vii, p. 507; *id. ibid.* viii, p. 115; *Cat. No.* 959; *Hume & Marsh. Game-B.* iii, p. 168; *Legge*, *B. of C.* p. 1073; *Oates*, *B. of B. B.* ii, p. 283; *Barnes*, *B. of Bom.* p. 403; *Hume*, *Nests and Eggs* (*Oates' ed.*), iii, p. 289; *Salvadori*, *Cat. B. M.* xxvii, p. 209; *Blanford*, *Avifauna B. I.* iv, p. 436, *Stuart Baker*, *J. B. N. H. S.* xii, p. 11; *id. Indian Ducks*, p. 133 (1908); *Whitehead*, *J. B. N. H. S.* xxi, p. 169 (1912); *Oliver*, *ibid.* xxvi, p. 675 (1919).

Polionetta pœcilorhyncha, *Oates*, *Game-B.* ii, p. 150.

Description. Adult Male.—Crown from forehead to nape dark-brown, a streak of the same colour covering the lores and running through the eye to the back of the ear-coverts; remainder of head and neck buff-white, more or less centred dusky, with the exception of the chin and throat; upper parts brown to brownish-black; the scapulars paler and edged with pale brown, as are some of the feathers of the back; rump and upper tail-coverts deeper brown still; tail the same, but darker and more glossy, the feathers edged pale; lesser and median wing-coverts grey, the greater ones dark-grey, subtipped with white and tipped black; speculum glossy-green, bordered on either side with black; secondaries tipped white and inner secondaries with the outer webs more or less broadly white, remainder of wings brown; upper breast fulvous-white, the feathers spotted with brown; abdomen yet darker and browner, and the under tail-coverts almost black. “Speculum . . . a rich emerald-green in most lights, a lovely rich blue or purple in others.” (*Hume*.) The amount of white on the inner secondaries varies a good deal, like the depth of colouration on the lower surface, which is sometimes nearly white on the breast, whilst at other times the whole of the lower parts are nearly uncoloured. The spots seem to increase in size with age.

Colours of soft parts.—Legs and feet deep coral-red, claws black; irides light- to dark-brown; bill black, terminal third or less of the bill varying from yellow to reddish-yellow or orange; a spot at the base of the bill on either side next the forehead orange-red to deep coral-red; lower mandible black-tipped, the same as the maxilla.

Measurements.—“Length 23·8 to 25·9 inches, wing 10·6 to 11·2, tail from vent 4·7 to 5·8, tarsus 1·84 to 1·93, bill from gape 2·4 to 2·75. Weight 2 lbs. 4 ozs. to 3 lbs. 5 ozs.” (*Hume*.)



THE SPOT-BILL OR GREY- DUCK.
Anas p. poecilorhyncha.
 $\frac{1}{3}$ nat. size.

Female Adult.—Similar to the male, but smaller and perhaps rather paler in colouration.

Colour of soft parts.—Legs and feet duller red than in the male, as also are the spots on the bill. "Wing about 10 inches." (*Salvadori.*)

Measurements.—"Length 22·0 to 24·0 inches, wing 8·9 to 10·7, tail from vent 4·9 to 5·3, tarsus 1·7 to 1·9, bill from gape 2·3 to 2·5. Weight 1 lb. 14 ozs. to 2 lbs. 12 ozs." (*Hume.*)

The average length of the wing for both sexes is 10·60 inches and of the bill 2·14.

Young.—Resemble the adults, but have no red spots at the base of the bill and have the feet coloured orange to brick-red. The general plumage is lighter, the spots fewer in number and less in size, the breast being spotted with white.

There appears to be no record of any post-nuptial change in the plumage of the drake of this species, and enquiries made on this subject elicit no evidence to show that there is such a change.

Blanford (*in loc. cit.*) shows that the male has twenty rectrices, whereas the female has but eighteen. This is very remarkable, and it is to be hoped that other observers will note the number of rectrices in both male and female, so as to ascertain whether the difference is constant.

Distribution.—The Spotted-billed Duck is found practically throughout India. It does not seem to have been recorded from South Konkan; but as it occurs in Ceylon, it would naturally be almost sure to appear more or less frequently in the South Konkan also. It is also found in western and South Assam, Cachar, Sylhet and possibly Aracan. It has once been shot in Kashmir.

Nidification.—Hume says :—

"The breeding-season varies a great deal with the locality. In the North-west Provinces, Oudh, and the Eastern portions of Rajputana and the Punjab, it only breeds, so far as I yet know, once a year, laying during the latter half of July, August and the first half of September. In Sind it lays in April and May, and again in September and October. In Guzerat it certainly lays in October and in Mysore in November and December, though whether in these two last-named provinces it has also a second brood, I have not yet ascertained."

In Sehore Whitehead saw tiny ducklings in November.

In Bengal I think it lays principally in July and August; but a few birds are earlier, and these may have a second brood, for nests have been taken as late as October. On the huge bheels extending over the whole of the north of Mymensingh and Sylhet these birds

have been seen accompanied by their young in April, and again their eggs have been taken in August, and I have had one nest with eggs reported from the former district in January.

As a rule, the nest is a compact, well-made structure, of a broad, rather irregular cup-shape, made principally of grasses, rushes, and weeds, and lined—in almost all cases—with down taken from the breasts of the ducks themselves. Sometimes there is no down at all, as in the nests taken by Captain Butler at Langraij between Deesa and Ahmedabad, and in no case does the down seem to be nearly as plentiful as it is in the nests of the more northern-breeding ducks.

Captain G. F. L. Marshall gives the dimensions of a nest taken by him as follows: "About 9 inches across, 3 deep, and the sides fully 2 thick." This is perhaps a trifle smaller than the average nest, as the size depends so much on the compactness with which it is built.

Major Woods, I.M.S., sends me very interesting notes from Manipur on the breeding of this duck. He writes:—

"Here the birds generally pair about the beginning of April; but I have found a nest in a flooded dhān khet as late as October. The nests are composed of grass and feathers, the latter of which the parent birds pluck from their own breasts.

"I have found as many as fourteen eggs in a nest, though the usual number is ten. The parent bird sits very close when incubating, and when alarmed feigns injury to a wing, as do others of the family.

"Towards the end of the rains both old and young birds frequent more open water and the flooded rice-fields. A place called the Kurram Path, about eighteen miles from Imphal, is a favourite breeding-ground, and towards the end of the rains the ducks may there be seen in hundreds with flappers in every stage of development."

In another letter he remarks on the curious fact that though the normal number of eggs laid is about ten, yet one never sees a family-party containing more than six or seven young ones, so that the percentage of addled eggs or of accidents to the young after birth must be very great.

Mr. Doig found on one occasion that otters had been responsible for the destruction of a nest of eggs. He found a nest at Narra in

Sind, on the 1st May, which had contained ten incubated eggs, but these, with the exception of one, were all scattered about and broken. Before reaching the island on which the nest was placed he had noticed a family of otters playing about, which all bolted at his approach, and which were doubtless the culprits concerned in the pillage of the nest.

The greater number of nests are placed on the ground, well concealed in rushes and grass, often at the edge of some piece of water or stream, frequently on islands, and not seldom in patches of grass well away from water. The ridges between rice-fields seem to be favourite places for them to make their nests upon, the proximity of the food supply doubtless being the incentive to the birds to make use of such spots.

Hume thus describes the first nest taken by him :—

“ It was placed on a drooping branch of a tree which hung down from the canal bank into a thick clump of rushes growing in a jheel that near the bridge fringes the canal. The nest was about nine inches above the surface of the water, and was firmly based on a horizontal bifurcation of the bough. It was composed of dry rushes and had a good deep hollow in which down, feathers, and fine grass were intermingled. The nest was at least a foot in diameter, perhaps more, and I suppose two inches thick in the centre and four at the sides ; it contained three fresh eggs.”

The number of eggs laid seems to vary considerably ; but from about eight to ten may be considered as the normal number laid, often less, but not often more, though they may occasionally number fourteen. They are much like the eggs of the mallard in appearance, though rather broader on an average, as well as a little shorter. Hume’s dimensions for the eggs of this duck are : length from 2·08 to 2·3 inches, breadth 1·65 to 1·18, and the average of fifteen, 2·15 \times 1·70.

The eggs in my collection are of two rather distinct types—the one a broad regular oval, the other a narrower egg with one end very much smaller than the other, and distinctly pointed. The texture is the same in both kinds and the colour also, generally a pale buff-drab, much stained as incubation progresses. The two types average respectively 2·05 \times 1·62 inches and 2·18 \times 1·60.

Spot-Bills do fairly well in captivity, but are difficult to tame, and

generally clear off as soon as they can fly. They have been known to breed in confinement: those in the Calcutta Zoological Gardens did so in 1885. They will also interbreed with the domestic duck; and there is a specimen in the British Museum collection of a hybrid between *A. pacilorhyncha* and *A. platyrhyncha*.

The birds are very good parents; the duck sits close and both she and the drake show the greatest consternation when their nests are discovered. Sometimes the disturber of their peace is tempted away from the vicinity of the nest by the duck pretending to be wounded, and fluttering about a short distance ahead, leading him to believe capture to be an easy matter until the capture is really attempted. Sometimes the birds wheel round and round in the air just above the nest and refuse to leave, even after its contents have been rifled.

They also show great affection to one another, and if one of a pair is killed, the remaining one has been known to refuse to leave the spot until he—or she—as the case may be—also falls a victim to its constancy.

General Habits.—Like all our local ducks, though not strictly migratory in the true sense of the word, yet they wander about a good deal under the influence of the seasons and want or otherwise of water. Thus, in the dryer portions of their habitat they are rainy weather visitants, appearing only when the jheels and ponds contain sufficient water to satisfy their wants. In certain parts also, quite independently of the water-supply, this duck is much more common than in others; thus, all round the Twenty-four Parganas, Nadia, Khulna, Jessore and the Sunderbands generally it is decidedly rare, but gets more common as one works further north or west. It is even more rare in the extreme north and north-east, but common all over Central India, getting more rare again towards the south. In Ceylon itself it does not seem at all rare, for though Legge never met with it, he writes of others having done so not infrequently. He seems, however, to believe it to be only a winter visitant, but it will very likely eventually be found to be resident.

In Manipur it is very common. Major Woods says (*in epistola*) :—

“ This (the Spotted-Billed Duck) is a very common duck in Manipur, though in the rains and in the nesting season, owing to the dense grassy jheels to which it resorts, it is seldom seen.”

Hume seems to think that it never ascends the hills to any height; but it is found in Manipur up to 3,000 feet. Major Woods records it from the Tankul Hills at heights over 3,000 feet. I have seen it in the Cachar Hills in valleys up to about the same height; and it has been recorded from the Darjeeling Terai up to about 4,000 feet, and again by Major Oliver from Kashmir.

The Spotted-Billed Duck is not a sociable bird, either with its own kind or with other species of duck; often it is found singly or in pairs, and the flocks seldom number much over a dozen, though in rare instances they run up to as many as forty, and Major McInroy frequently observed flocks of at least 100, and these he had seen both on the wing and at rest.

If they ever have to associate with other ducks, Hume says that they give the preference to teal or shovellers; and Woods writes to me:—

"I have often seen an old solitary Spot-Bill piloting a flock of Teal across a jheel and jungle."

In such cases the Spot-Bill may have had the company of teal thrust upon him whether he desired it or not.

Their haunts seem to vary very much; probably they prefer tanks, jheels, and small pieces of water which are well covered with weeds, and they seldom resort to large open pieces of water. Thus, in Manipur, I am told that the Spot-Bills do not, as a rule, frequent any of the larger, clearer sheets of water, and that on the Lagtak Lake they are quite rare ducks when compared with the others which are found upon it. They inhabit the smaller jheels, which are surrounded near the margins by jungle, and here they may be seen all asleep during the heat of the day, except one or two which are on sentry-duty near the edge. In the district of Mymensingh, however, they are found in the vast jheels which stretch for miles in every direction, and here also they breed in great numbers.

They are also found, though I think but rarely, on small quickly-flowing streams in forests. On the other hand, on some of the bigger rivers they are not uncommon. Hume has "shot them several times both on the Ganges and Jumna (on both of which, however, they are rare), while on the Jhelum, Chenab, and Indus

they are quite common," and they are found, though not frequently, on the Brahmapootra. I have no record of their occurrence on the Megna, Surma, Barak, or any other of this network of rivers, though it is probable in the extreme that they may be met with here and there on any of them.

This appears to be entirely a fresh-water duck, and this would be sufficient to account for its comparative absence from the Sunder-bands and their tidal and brackish waters. Whether it occurs on the Chilka Lake—also of brackish water—I cannot say.

The Spot-Bill is, in every sense of the word, one of the finest and most game of our ducks. Even larger on an average than the Mallard, it fully rivals that bird for the table, and is, I think, more uniform in its good condition ; this no doubt is due to the fact that it has not to overtax its strength in long migrations. It is a strong flyer, though not so quick in rising and not so speedy in getting under way as is the Mallard. When it first rises, Hume compares it to an old hen, such a noise and flurry does it make, but the pace it puts on once it is fairly started compensates for its slowness at first. It is, perhaps, an easier bird than most of its size and weight to bring down when hit, owing to its plumage being rather less dense than that of many other ducks. Even when brought down, however, it is not necessarily brought to bag at once, as it is a most expert diver, and is one of those ducks which dive and grasp the weeds under the water, and so keep hidden below the surface ; more often, though, it rises, but only high enough to allow of the tip of the bill protruding. Hume, Butler, and others have recovered birds quite dead, drowned through holding on to the weeds a little too long below the water. If winged, so as to render diving either painful or impossible (a twisted wing prevents most ducks from diving), it will make for the nearest cover ; indeed Woods informed me that he has found that the majority of those he has wounded without killing outright have taken this means of trying to avoid capture ; at the same time, he adds that they both dive and swim well.

Most writers agree that the voice of the Spot-Bill and of the Mallard are very much alike ; but Hume considers that the quack of the former is the more sonorous. I cannot say that I have noticed any difference between the two.

These ducks are not shy birds, and until they have been much shot at can generally be fairly easily approached near enough for a shot.

They are principally vegetable feeders, and do a good deal of damage to rice, both when young and when in the ear, trampling down a great deal more than they eat; they also, at times, eat all sorts of miscellaneous food, such as water-mollusca, frogs, worms, insects, etc. Woods observes that the places where they feed can generally be detected at a glance from the state of the much-trampled blades of rice and the numerous feathers lying about. He says that he has had good sport by concealing himself in such places on bright moonlight nights, and shooting the birds as they fly over. He has also been successful in getting capital sport with them over a decoy. The Musalman Manipuris catch numbers of the flappers with spears and nets; and they sometimes form part of the bag when the natives in other parts of India have a duck-drive into nets.

In Southern India (Mysore?) Mr. Theobald says that the shikaris get within easy shot of these ducks by making bundles of rushes and weeds, and pushing these along the surface of the water in front of them, the bundles affording a floating rest for their guns and also concealing the approach of the shooter.

(26) ANAS PÆCILORHYNCHA ZONORHYNCHA.

THE EASTERN GREY DUCK.

Anas zonorhyncha, *Swinhoe, Ibis*, 1866, p. 394 (Ningpo); *Salvadori, Cat. B. M.* xxvii, p. 211; 'Asian,' Jan. 10, 1899; *Stuart Baker, J. B. N. H. S.* xvi, p. 12; *Oates, Game-B.* ii, p. 148; *Stuart Baker, Indian Ducks*, p. 140 (1908); *Harington, J. B. N. H. S.* xxi, p. 1086 (1912).

Description.—The eastern form of the Grey Duck differs from the Indian Spot-Bill in not having at any period of its life the two red spots at the base of the upper mandible, and in having the speculum blue, and not green as it is in that bird. Also the outer secondaries have far less white upon them—indeed, in some birds this is almost absent. The following differences are also noticeable in comparing series of the two ducks; in the eastern form the chin, throat, and fore-neck are conspicuously white, and contrast strongly with the rest of the underparts, which are far darker than in the western bird. In both, the under tail-coverts are very dark brown, but whereas in *zonorhyncha* these are almost concolorous with the feathers of the vent and lower abdomen, in *pæcilorhyncha* the abdomen is much lighter, and contrasts distinctly. In the latter the underparts are generally very much spotted, the spots increasing with age, in the former the spots are nearly or quite obsolete. In the Eastern Grey Duck the white of the supercilium is also much purer and better defined than in the Western Grey Duck. The soft parts, with the exception of there being no spots at the base of the bill, are the same as in the other Grey Duck.

Measurements.—The bill averages smaller. In the series of *pæcilorhyncha* in the British Museum there are females with bills up to 2'20 inches, and males up to 2'38 straight along the culmen from tip to feathering on the forehead.

The largest male of *zonorhyncha* has the bill only 2'25 inches, and the next biggest bird, unsexed, has it 2'20. The largest sexed female has it 1'98.

The average wing measurement for both sexes is 10'71 inches, and of the bill 2'07.

Distribution.—Trans-Baikalia, Eastern Siberia and Mongolia to Japan (Yezzo and Riu-kiu) and Northern China. In winter south to China, Cochin China and Yunnan. There is a typical specimen recorded from Kengtung in the Shan States, and Harington also

records the shooting of another specimen at Tongyi, Burma, in December, 1911.

Nidification.—In China this duck breeds principally from the end of May to early July. Styan took its eggs in May in the Yangtse Valley and again in July, though the eggs were then hard-set. At Foochow at Swatow, La Touche found it common and breeding on a rocky island outside Swatow Bay in May, June and July. Eggs taken in the latter months were so advanced that they hatched in the boat as they were being taken away. La Touche says that the nests “were found hidden among the low brushwood and rank grasses on the summit of the island.”

In Japan it breeds from April onwards until early July. I have had fine series of its eggs from Owston, and the earliest clutch was taken on the 27th April and the latest on the 3rd July.

The nests were described as being just like those of the Mallard, fairly compact and well-built, with a dense lining of down, this increasing greatly in amount after the first few eggs were laid. They were placed on the ground in amongst weeds and grass and generally well-concealed.

My eggs average about 57.0×39.5 mm. ($= 2.24 \times 1.55$ inches).

The usual number seems to be eight to ten in a clutch, but both bigger and smaller clutches are often found.

General Habits.—These appear to be very similar to those of the Indian Spot-Bill, but instead of being entirely restricted to islands, swamps and rivers, this form is also found on and near the coast.

According to Gee and Moffett it is often tamed by the Chinese and hybrids between it and the domestic duck may often be seen.

(27) *ANAS PÆCILORHYNCHA HARINGTONI.*

THE BURMESE GREY DUCK.

Polionetta haringtoni, *Oates, J. B. N. H. S.* xvii, p. 558 (1907) (Shan States).

Anas zonorhyncha, *Stuart Baker, Indian Ducks*, p. 138 (1908).

Anas haringtoni, *Harington, J. B. N. H. S.* xxi, p. 1086; *Stuart Baker, ibid.* xxii, p. 805; *Bell, ibid.* p. 400; *Stevens, ibid.* xxiii, p. 734.

Description.—This duck is intermediate between the Indian and Chinese birds, and is in general appearance very close to the former, from which it differs principally in having no red spots at the base of the bill, or only a faint trace of them.

The under-parts are pale as in *pæcilorhyncha*, but less spotted, and the speculum is green as in that bird instead of blue as in *zonorhyncha*.

It is a slightly smaller bird, the bill averaging only 2·05, and the wing 10·25 inches.

Distribution.—The whole of Burma, including Shan States and Chin Hills, Yunnan, Cochin China and the extreme east of Assam.

Stevens got a number of these ducks in North Lakhimpur. In 1902, Messrs. Moore and Mundy got several specimens in Dibrugarh, and each succeeding year up to 1905 got others. I obtained my first specimens in 1903, and got a good many more in 1904 and 1905.

Nidification.—The Eastern Grey Duck is of course resident where found, and breeds throughout its range. I took its eggs, three fresh, in Dibrugarh, and Harington took a hard-set clutch of eggs in the Shan States.

The eggs differ in no way from those of the spot-bill, but average smaller.

My eggs measure 55·0 × 39·5; 56·5 × 38·5 and 58·7 × 41·0 mm.

These are shown by Hartert as the eggs of *zonorhyncha*, as at the time I wrote to him I did not admit *haringtoni* as a separate race.

On one occasion only did any of us see the bird in any numbers, and on this Mr. Moore came across a flock of about forty on a small collection of shallow swamps on the road to Dimaji in Lakhimpur. He obtained two or three specimens, and on his return to Dibrugarh told me of the flock, and when I went out some ten days later the flock was still there, and I got a pair in the first drive. They refused to leave the swamps round about, but after the first two shots had been fired it was impossible to get near them or to get them to pass within shooting distance of our mychans.

As a rule, we found the birds either singly or in pairs, less often in small flocks of four or five birds, but in the former case they were always in company with teal, gadwall or other ducks of some kind. They were just as wild as all the other ducks in this district, and the only way we could get them was by driving; no amount of artifice or care could get one within decent shooting distance otherwise. We had small and extremely dicky mychans, or platforms, made in different places in the huge bheels; these were well concealed by reeds and water-plants, and we got into them with as little noise as possible, and then sent boats all round about to put up the birds. The local people knew the habits of the duck well, and generally managed to arrange the hiding-places so that they were in the line of flight most often taken by the birds, and we got a great deal of very pretty shooting in this way, though our bags were not heavy. Still we often managed to pick up thirty or forty birds, losing sometimes as many more in the impenetrable cane-brakes, and by winged birds diving and so escaping or being carried off by the many eagles which infest these waters. We could, of course, see all round us by peering through the reeds, but there were four sides to watch on; and often, as we watched a flock coming up in front of us, a second would come up from the opposite direction, and the first we knew of it would be the sound of their wings as they hurtled through the air high overhead. Sometimes, too, as we watched, a flight of teal would rush by only a foot or two above the water, almost passing out of fire before being spotted. Consequently, the shooting was not all it might have been as regards hitting, and it required a rare good man behind the gun for cartridges to average not more than two per head of game.

Genus EUNETTA.

The genus *Eunetta* may be at once distinguished from *Anas* by the sickle-shaped inner secondaries in the male, and by the remarkable length of both upper and lower tail-coverts, which extend beyond the rectrices.

From *Chaulelasmus*, *Eunetta* may also be distinguished by the number of rectrices, which is sixteen in the former and only fourteen in the latter. The females, however, of *C. streperus* and *E. falcata* are so much alike that their differences are given in full below. There is only one species in this genus, *E. falcata*, which occurs throughout Eastern Asia.

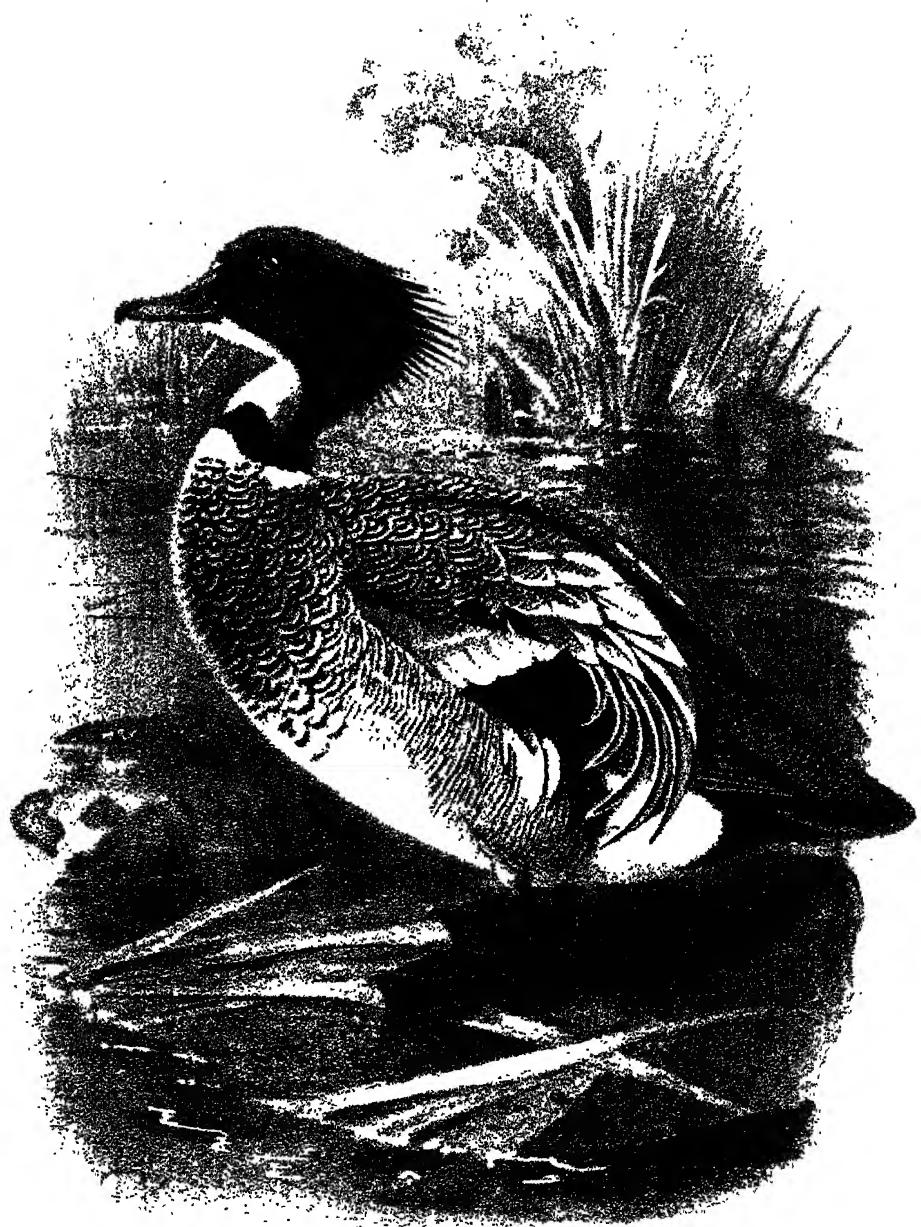
(28) EUNETTA FALCATA.

THE BRONZE-CAPPED TEAL.

Anas falcata, *Georgi, Bemerk. Reise. Russ. i*, p. 167 (1775) (Asiatic Russia); *McLeod, S. F. x*, p. 168; *Hartert, Vog. Pal.* p. 1324 (1920).

Querquedula falcata, *Hume, S. F. iv*, p. 225; *id. ibid. vii*, p. 494; *id. ibid. viii*, p. 115; *id. Cat. No. 966 bis*; *Hume & Marsh. Game-B. iii*, p. 231; *Reid, S. F. x*, p. 84.

Eunetta falcata, *Salvadori, Cat. B. M. xxvii*, p. 218; *Blanford, Avifauna B. I. iv*, p. 438; *Oates, Game-B. ii*, p. 202; *Inglis, J. B. N. H. S. xiii*, p. 180; *id. ibid. p. 378*; *Comber, ibid. xiv*, p. 149; *Stuart Baker, ibid. xv*, p. 141; *Hopwood, ibid. xvi*, p. 249; *Inglis, ibid. xvii*, p. 1015; *Stuart Baker, Indian Ducks*, p. 143 (1908); *Hopwood, J. B. N. H. S. xvii*, p. 433 (1908); *Glancorp, ibid. p. 683*; *Kelly, ibid. xx*, p. 219 (1910); *Hopwood, ibid. xxi*, p. 1220 (1912); *Wall, ibid. xxii*, p. 202 (1913); *Higgins, ibid. p. 399* (1913); *Bignell, ibid. xxiii*, p. 160 (1914); *Hopwood, ibid. p. 365* (1914); *Stevens, ibid. p. 735* (1915); *Waite, ibid. xxiv*, p. 599 (1916); *Higgins, ibid. p. 606* (1916).



THE BRONZE-CAPPED TEAL.
Eunetta falcata.
 $\frac{1}{3}$ nat. size.

Description. Adult Male.—“Crown deep chestnut; sides of the head bronze-purple, greener posteriorly; a long green mane on the back of the nape; throat and upper part of the neck white, intersected below by a green collar; mantle and upper scapulars with narrow crescentic bands grey and blackish; rump blackish; basal upper tail-coverts grey, vermiculated with black, the longer ones black and entirely hiding the tail; upper breast waved with alternate crescentic bars of black and white, producing a regular scaly appearance; lower breast whitish, each feather with black bars, one of which is sub-terminal; sides, flanks, and abdomen waved with narrow black and greyish bands; under tail-coverts black, very long, and reaching beyond the tail; on each side of the under tail-coverts a very distinct buff patch, the bases of the feathers being black, showing a beautiful black bar, which separates a buffy patch from another silky white band formed by the tip of the lowest flank-feathers; scapulars grey, narrowly waved with black, and more or less distinctly whitish on the edges; a black patch on the outer scapulars; wing-coverts grey, the last row whitish; wing-speculum on the secondaries dark glossy green, bounded below by a narrow whitish band at the tip of the secondaries; tertials very long and narrow, sickle-shaped, with the shafts whitish, the webs velvety glossy black, the edges and part of the inner webs grey; quills dark grey, almost blackish towards the tip; under wing-coverts white, but the greater ones grey; axillaries white; tail-feathers grey, with narrow white edges; bill greenish-black; feet dull blue-grey, darker on the web; iris brown. Total length 19 inches, wing 10, tail 3, culmen 1.8, tarsus 1.35.” (*Salvadori*.)

Colours of soft parts.—“Irides deep brown; bill perfectly black; legs and feet drab with an olive tinge; the webs, except immediately alongside the toes (where they are unicolorous with these), and claws dusky black. A frontal spot ending in a point on the culmen, about 0.4 inch long and 0.3 wide, pure white.” (*Hume*.)

Measurements.—“Of another Indian-killed male, the wing also measures 9.5 inches.” (*Hume*.) “Bill from gape 2.1 inches.” (*Blanf*.)

Female.—“Head and neck brown streaked with whitish, much paler beneath; back and scapulars brown, with concentric pale-rufous bands; lower back and rump blackish; upper tail-coverts brown, with concentric pale bands; tail-feathers brown; quills brown; speculum black, slightly glossed with green; wing-coverts greyish brown, with pale edges, especially the greater coverts; upper breast and sides dull-rufous, with concentric brown bars; abdomen whitish, with a few bars or spots; under tail-coverts rufescent, with brown marks.” (*Blanf*.)

Colours of soft parts.—“Bill, feet, and irides as in the male.” (*Salvadori*.)

Measurements.—“Wing 9.85 to 10.06 inches, tail 3.23 to 3.57, bill at front 1.75 to 1.84, tarsus 1.40 to 1.62.” (*Schrenk*.) “Length 16.0 inches, wing 9.0, tail 3.4, tarsus 1.2.” (*Dresser*.)

Distribution.—The strict habitat of this little duck is Eastern Asia, whence it ranges occasionally west, sometimes entering Eastern Europe. It breeds throughout Eastern Siberia, and lately I have received notes of its breeding from Manchuria. In the winter it descends south, and is common in China and Japan, and of very rare occurrence within our limits. Seeböhm says ('Birds of the Japanese Empire') :—

"The Falcated Teal is a winter visitor to all the Japanese islands. The Perry Expedition found it to be one of the most abundant of the water-birds of Japan, and noticed it at various points during the voyage."

In India, until quite recently, few specimens have been obtained since Hume's time, more probably owing to no notice being taken of them than for any other reason—although their occurrence is, of course, rather rare. Hume notes five specimens which came into his possession: of these, two were caught by fowlers near Lucknow, and given to him by Dr. Bonavia; Major C. H. T. Marshall shot a male at Kurnal, seventy miles north of Delhi, in February; another was shot in the same month about thirty miles from Delhi by Mr. W. M. Chill; and the fifth was obtained by Hume himself in the Calcutta Bazaar, and this he says was caught in the immediate vicinity.

Shortly after this General McLeod recorded that he had shot a female at Feroza, Bhawalpur, in December, 1879; and G. Reid, in the same volume of 'Stray Feathers' as that in which this record is made, states :—

"Two years ago I myself saw two or three in possession of a native fowler, who would not part with them except at a fancy price, saying he meant to take them with a lot of others he had to the ex-king of Oudh, who would pay him handsomely."

He does not say whether the "lot of others" were of the same species; presumably not.

Two young males, one without the sickle-shaped secondaries and one with these fully developed, were obtained by Mr. Finn in the Calcutta Bazaar; a specimen has been shot in Purneah; two specimens—an adult male and a young bird of the same sex—are in the Lucknow Museum, and were, I believe, obtained near that

place. Besides these, one was obtained in Upper Burma, near Bhamo, in 1903, and a second by Hopwood at Kindat in March, 1906, and others by the latter in Aracan and the Chindwin; Major Cowley, of the 43rd Gurkha Regiment, obtained one in Manipur, and Colonel Tytler and Mr. Higgins each also obtained one there. In Tirhoot Mr. Inglis has obtained many specimens, and the western records have lately been added to by Mr. L. Robertson, who obtained an adult male of this species in the Narra Valley, Sind.

Glasscock obtained a male at Jullunder, Kelly and Bignell each one near Roorka, Wall one in Gonda, Oudh, and Waite one at Delhi and one in Ferozepur, the sex not given, and Barton also obtained one, unsexed, at Llashar, U.P.

In addition to those recorded above, the only other specimens I have ever heard of was one, a young male, shot by my father, Mr. E. B. Baker, in Jessore, and several shot by Messrs. Moore, Mundy, Stevens and myself in Assam.

Anderson obtained specimens on the Taipeng river, in Upper Burma; but I cannot ascertain how many he got.

There is no reason, however, that sportsmen in Upper Burma should not meet with this bird much more often than would seem to have been the case hitherto, for North-east Burma is well within range of its annual migrations, and now that sportsmen are alive to the fact that records of rare ducks are still desirable, we ought to have a good many from that quarter.

Nidification.—The Bronze-capped Teal breeds throughout Southern Siberia to the east centre, but rarely to the west; it has been found breeding on all four shores of Lake Baikal, but even there more plentifully to the east and south; it breeds also on the Amur, and probably a good deal further north. Middendorff says that it "breeds plentifully in the Stanaway mountains, and nearly to the tops of the ranges," and, as Hume points out, if it selects sites at as high an altitude as this, it is sure to extend considerably further north in the plains.

In Manchuria, where my informant took several nests, the birds are said to make them in low-lying parts, along the banks of the larger rivers, which are more or less in the condition of swamps. The nest appears to be a rather well-built affair of rushes and reeds

rather more compactly put together than are most ducks' nests, and lined very plentifully with down, presumably taken from the breasts of the parent birds themselves. So thick is this down that in some of the nests, the cups of which were in some cases as much as six inches deep, it filled them completely to the top, hiding the eggs which were inside. The nests were placed in thick tufts of grass, beds of sedges, or, more rarely, under and amongst bushes; they were not very carefully hidden, and, but for the treacherous nature of the ground in which they were found, not particularly hard to get.

The duck is a close sitter, and is assisted in the duty of incubation, at least occasionally, by the drake, which is seldom found far from the nest. They lay from six to nine eggs, beginning to lay in the end of May, and continuing through June and the early part of July.

In Sakhalin, near Taraika, Alan Owston's collectors took a large number of nests, in many cases with one or both parents, and a large number of eggs came into my hands, as well as one or two clutches from Japan itself.

At Taraika the biggest clutch numbered nine and most were of six or seven. Unfortunately in no case was the down collected with the birds and eggs.

In appearance the eggs are like those of the teal, but more consistently of a yellow, or pale café-au-lait stone-colour. I have seen no white eggs as described by some authors and none with the pale sea-green tinge seen in so many ducks' eggs. Normally they are rather long ovals, though with the small end but little compressed, but one or two of the clutches consist of eggs almost as broad an oval as those of the whistling-teal with which, however, they agree neither in texture or colour. The former, the texture, is like that of the common teal, very fine, close and intensely smooth with a fair gloss.

Including the eggs measured by Hartert and recorded by him, in 'Palaearctic Birds,' the average of ninety-seven eggs is 56.2×39.1 mm. ($= 2.21 \times 1.53$ inches).

The maxima are 58.5×39.0 mm. ($= 2.3 \times 1.5$ inches) and 57.0×42.2 mm. ($= 2.24 \times 1.66$ inches).

The minima are 51.1×41.0 mm. ($= 2.01 \times 1.61$ inches) and 57.0×37.7 mm. ($= 2.24 \times 1.49$ inches).

The descriptions of the nests agreed with those taken in Manchuria and were placed in similar positions. The earliest-taken clutch I have is dated the 27th April, 1910, and the latest the 12th July, most nests having been found in the first three weeks of June.

Dybowski (*vide* Hume) says that in Western Dauria and the country to the south of Lake Baikal "the Crested Teal arrives in great numbers during the later half of April, but in the Darasun region it is more common.

"The female makes her nest among the bushes of swamps, collecting dry reeds and grass, and lining it thickly with down. At the beginning of June she lays eight eggs, sits closely, and only rises at your feet.

"They remain in autumn as late as 27th December."

It will be noticed that nearly all the specimens obtained hitherto are males, but in Assam I found that for every male we got in distinctive plumage, we obtained many females and young males, such as in most cases are put down as Gadwall.

General Habits.—The Bronze-Capped Teal, when found within our limits, appears always singly or in pairs, perhaps very rarely in small parties. In places where it is more numerous it collects in flocks, as a rule rather small, consisting of about twenty or thirty individuals, but at other times in very large flocks; and it is said to arrive at the borders of its breeding-grounds in immense flights. It has the reputation of being a very sociable, if not a highly gregarious bird, and small flocks frequently, indeed generally, seem to mix much with larger flocks of other species of teal and duck, with whom they feed and sleep in perfect harmony.

The flight is said to be swift and teal-like, and the bird to be very strong and active on the wing. I can find no record concerning these birds' swimming and diving powers, so that we may expect to find that these are neither abnormally developed nor yet much less in extent than they are in other teal.

Its cry, when on the wing, is noted as a "tolerably loud and piercing whistle" (*Prjevalski*); and it has also been heard to give vent to a chuckling quack as it swims about feeding, a note which I have heard it utter in Assam, and which struck me as much like the feeding-note of the mallard.

Its diet seems to be principally, if not wholly, vegetarian, but very little has been written on this point.

The female Bronze-Capped Teal is so like the female gadwall that both Hume and Salvadori give the points by which they may be determined. They are these:—

The principal difference lies in the wing-speculum: in the gadwall "the entire visible portions of the later secondaries are pure white, the terminal portions of their larger coverts white.

"In female *falcata* the visible portions of the later secondaries are black, with more or less metallic-green reflections, narrowly tipped with white, and the terminal portions of their greater coverts are black."

The maxilla also of the gadwall is only dark along the culmen, whereas the whole of the upper mandible of the Bronze-Cap is dark. So also there is always more or less of an orange or yellowish tinge on the feet and legs of the gadwall, whereas there is no trace of this colour on those of the other duck, in which they are more or less of a light slate-colour. These last differences, however, will not be very noticeable in the dried skin, and not at all in very old specimens, and can only be of any use in discriminating birds in the flesh. It should always be borne in mind by anyone wishing to ascertain the identity of a bird that it is infinitely easier to do so whilst it is in the flesh than afterwards, when it has become a dried specimen; the colours of the soft parts are then undiscernible, small marks of feathers, such as rings round the eyes, indistinct supercilia, and similar markings, are seldom as definite as in the fresh bird, and often, if roughly handled in the skinning, become totally lost. Thus the bird should be identified in the flesh as soon as possible; and if it cannot be, the colours of the soft parts must be carefully noted, and a rough note made also of anything remarkable in the colouration.



THE GADWALL.
Chaulielasmus streperus.

female.

male

(29) CHAULELASMUS STREPERUS.

THE GADWALL.

Anas strepera, *Linn. S. N. x. ed. i*, p. 125 (1758) (Sweden); *Hartert, Voy. Pul.* p. 1320 (1920).

Chaulelasmus streperus, *Jerdon, B. of I. iii*, p. 802; *Hume, S. F. vii*, p. 115; *id. Cat. No. 961*; *Scully, S. F. viii*, p. 362; *Hume & Marsh. Game-B. iii*, p. 181; *Oates, Birds of B. B. ii*, p. 283; *Barnes, B. of Bom.* p. 405; *Salvadori, Cat. B. M. xxvii*, p. 221; *Blanford, Avifauna B. I. iv*, p. 440; *Stuart Baker, J. B. N. H. S. xii*, p. 24 (1898); *Oates, Game-B. ii*, p. 234; *Dewar, J. B. N. H. S. xvi*, p. 498; *Cumming, ibid.* p. 697; *Ward, ibid. xvii*, p. 943 (1907); *Stuart Baker, Indian Ducks*, p. 148 (1908); *Whitehead, J. B. N. H. S. xx*, p. 978 (1911); *Wait, Spolia Zeylonica*, x, part 39, 1917.

Description. **Adult Male.**—Head and neck whitish, rufous-white, or dull rufous, densely speckled with brown, except on the chin, which is almost pure white in highly-plumaged birds; the anterior portions of the head nearly always lighter than the posterior in ground-colour, which shades off into brown of the nape, on which the darker spots hardly show; lower neck, back, and scapulars deep blackish-brown to dark rufous-brown, every feather beautifully waved with white crescentic lines; lower back darker, with fewer and finer vermiculations, sometimes almost unmarked, changing into the black of the rump and upper tail-coverts; central rectrices grey, outer ones rufous-grey with almost white edges, generally increasing in width to the outermost ones, breast, sides of the body, and flanks like the back, but the breast more boldly marked with the dark and light, and the vent and flanks more finely so, rest of the abdomen, &c., white, under tail-coverts, typically the same velvety-black as the upper, but often splashed with patches of black and white vermiculations; the smallest wing-coverts like the scapulars; the median and primary greater coverts chestnut, with the bases brown and white, sometimes showing; greater coverts next the secondaries black; secondaries pure grey, silvery towards the tips; a speculum formed by the outer secondaries, four or five glossy velvety black and three with broad pure white outer webs, those next the black often with a narrow black edge; primaries brown-grey, darkest at the tips; shoulder of wing and under wing-coverts white.

The colours, as with nearly all ducks, vary considerably; the abdomen is sometimes as pure white as freshly-fallen snow, often tinged with rufous, and sometimes wholly of that colour. In the same way the colours of the head vary much also. I have a fine drake before me now, in which the rufous head contrasts strongly with the blacker breast; and again another drake in which the two colours blend with one another.

Colours of soft parts.—Maxilla dark slaty-brown, black or brown; mandible paler and yellowish or reddish on the gonys and tip; irides dark brown; legs yellow, brownish-yellow to dull orange; claws almost black.

“Legs and toes orange-red, less bright after the summer moult; claws black; webs dusky orange-red.” (*Hume.*)

Measurements.—Length 19·5 to 21·5 inches, wing 10·5 to 11·75, tail 3·4 to 4·3, tarsus about 1·5, bill at front 1·90 to 2·00 and from gape 2·05 to 2·25. Weight 1 lb. 7 ozs. to 2 lbs. 4 ozs.

Female.—General colour above brown, the feathers with buff or rufous margins, and the head and neck more or less spotted and streaked on a light ground; the scapulars unmarked dark-brown; rump and upper tail-coverts brownish-black; wings as in the male, but the chestnut, if not altogether absent, is present only on the outer webs of some of the median coverts; below, the breast and sides are pale-rufous, sometimes rather darker, spotted with brown; under tail-coverts and feathers about vent the same; remainder of lower parts white, more or less tinged with rufous.

Colours of soft parts.—Irides and legs the same as in the male; bill dull-orange to yellowish-brown, the culmen and tip brown.

Measurements.—Length about 18 to 20·1 inches, wing 9 to 10 (10·2, *Hume*), tail 3·0 to 4·0 (3·7 to 4·5 *Hume*), tarsus 1·37 to 1·42, bill at front 1·8 to 1·95 and from gape 1·95 to 2·15. Weight about 1 lb. to 1 $\frac{3}{4}$ lbs.

Young in first plumage.—“Closely resembles the adult female, but there is no chestnut or black on the wings, the white on the secondaries is dull, and the whole of the feathers on the under parts have obscure, ill-defined, brown centres.” (*Salvadori.*)

Young in Down are like those of the Mallard, “but there is a more pronounced golden tinge on the throat and cheeks, the streak through the eye is more defined, and there is a small dark spot at the junction of the mandibles, which the mallard has not.” (*Yarrell.*)

After the breeding-season the drake assumes a plumage similar to that of the duck, returning to his full-dress attire before the winter has fairly set in, though a few males may still be found in the female garb as late as the middle of November.

Distribution.—Outside India the range of this fine duck may be said to be the Northern Hemisphere. It breeds practically right across its habitat in the sub-Arctic regions, and in the winter ranges down to Northern and Central Africa, and perhaps even further south, almost the whole of Southern Asia, and again as far south as Mexico and Jamaica in America.

Within India, it is easier to say where it is not found rather than to enumerate all those places in which it does occur. Roughly

speaking, it is found in vast numbers from the Himalayas, throughout Sind, North Bombay, the North-west Provinces, Punjab and Bengal; from there it gets less common as it wanders south, until in Southern India, south of Mysore, it is very seldom found at all, though Dewar records that it occurs in Madras, and one has been shot in Ceylon in the Hambantota district.

Throughout Assam, Manipur, Tipperah, and in Burma it abounds, and it is plentiful also in the Sunderbands.

Nidification.—The Gadwall has not yet been found to breed within our limits, in spite of Hume's hopes to the contrary. That these are not groundless, however, is shown by the fact, that a duck shot in Cachar contained eggs in the ovaries as large as a big marble; and surely this bird could not have meant to have migrated far for the purpose of breeding. This bird was shot in the end of April. Again, a pair of birds were reported as having been shot in Kashmir in June (date?), but the person who shot them, finding the ovaries "very attenuated," jumped to the conclusion that the birds could not have been breeding. Is it possible that the eggs had been laid?

Whitehead shot it near Lachi on the 20th May, 1906, and Rattray got it at Thall in June.

It has been noted as breeding in the British Isles, and also in Norway and Sweden; indeed it has been found to nest as far north as Iceland, and there is a doubtful record of its having been found in Greenland. Its usual breeding-habitat is, however, far more south: throughout Southern Europe from Spain to Russia—not in Northern Africa, as far as we yet know—in North-west Asia, in the sub-Arctic regions, and in North America, where it has been found during the breeding-season as far south as Texas.

A male shot on the 20th June, 1918, was sent me together with some eggs said to have been taken from a nest on which the duck was sitting. The Tibetan who had previously had very bad luck when shooting small birds on their nests, was wisely afraid to shoot the female, so shot the male which was swimming close by. The eggs are quite typical Gadwall's eggs, and they are probably correct. A cock pin-tail was shot a few days later in similar circumstances, and here too the eggs are quite typical. Both nests were taken near the Rhamtso Lake at an elevation of about 14,000 feet.

Its nest is much like that of the mallard or of the Spotted-billed Duck, but, unlike the former, I have never heard or read of its breeding in trees. It is generally placed at the edge of the water in amongst dense sedge, reeds, or bushes, and appears as a rule to be carefully concealed ; it is made of reeds, grass, or any other similar material, or sometimes a few twigs, and is well lined with down from the birds themselves.

The eggs are said by various authorities to number five to fourteen ; but probably six to eight or ten is the normal clutch.

The eggs vary much in colour, from an almost pure white to a greenish-drab. As with most eggs of ducks, as incubation advances the colours get duller and darker, and eggs which are white with a clean yellow or green tinge when first laid become dull-grey or drab with the green tint dulled and sometimes lost. In texture and shape they do not differ from those of the mallard, except in being slightly smaller.

Thirteen eggs, measured by Hume, are said to have averaged $2\cdot62 \times 1\cdot15$ inches ; but this is probably a mistake for $2\cdot26 \times 1\cdot51$, within which limits all the eggs come which have passed through my hands.

The Gadwall seems to thrive well in confinement, and has often bred under these conditions, including several times in the Zoological Gardens.

General Habits.—Of course, in some places the Gadwall is more exceedingly abundant than in others. Thus in 1882-83, in Bengal, we found that the Gadwalls numbered at least two to every one of all other kinds of ducks lumped together. Of a magnificent bag made by three guns in the Moolna bheel (Sundarbans), out of 140 couple of ducks and teal I think at least 40 couple, if not more, must have been Gadwalls, and of the rest probably 70 or 80 couple were teal of sorts. Wood speaks of patches of water in Manipur “ looking black with the number of Gadwall assembled there.” They begin to arrive there, according to him, about the 15th October, and though in Kashmir and along the Himalayas a few birds may arrive earlier, this will be found to be about the earliest date for Northern India.

In Mysore they do not arrive until the end of November as a rule, and at intervening places will be obtained on intervening dates. In

Lower Bengal we never expected to see many before November, and I think they were most common in late December and early January. Hume says, *re* birds again leaving :—

“In the south they leave by the end of March or early in April. Farther north they are somewhat later (it depends a good deal on the season), and both in Sind and the Western and North-western Punjab they are frequently shot in the first week of May.”

The dates are, I think, too late for Bengal and Assam, where there are few birds left after the first week or so in March. When out snipe-shooting in that month on extensive jheels and similar pieces of water, a few Gadwall may still be put up, but nearly all that are seen will be hurriedly making their way north.

Major Woods, I.M.S., says that even in Manipur they leave about the end of March.

An interesting fact noted by this close observer is, that many, perhaps the majority, of the ducks pair off before leaving their winter quarters. He says most of them pair in March, but that he has noticed some pairing as early as February. No one seems ever to have noticed these birds arriving at their breeding-grounds in pairs, so it is to be presumed that, their preliminary courtship completed, the pairs re-assemble in flocks which remain together until they reach their nesting-haunts.

The Gadwall ranks very high up in the table of duck precedence, as there are so many good points about it which attract favourable notice. As an article of diet few ducks are better. Some people would give the prize in this respect to the mallard, others perhaps to the pintail, but take the Gadwall all round, it is hard to beat on the table. Personally, I have never known this duck to have a fishy or other unpleasant flavour, nor have I met any Bengal sportsman who has charged it with this crime. But the northern presidencies have sometimes held men who have complained of this flavour when the birds first arrive. They *ought* to be all right, as they are almost entirely vegetable feeders, subsisting much on wild and cultivated rice, water-weeds, &c., and seldom varying the diet with animal food. A drake shot in Silchar was found to contain a mass of small white worms in addition to some water berries and half-ripe rice, but this in no way affected the flesh.

Before cooking, however, he has to be shot, and though not, as a rule, a very shy bird, yet he is quite wide-awake enough to make the getting within shot of him an interesting, if not difficult job. Where, too, he has been shot at, all one's ingenuity and perseverance will be required before the game-bag can be made to assume the bulgy appearance it ought to have. Then, when you have got within shot, the Gadwall proves a thoroughly sporting bird ; he is quick off the water, rising rather straight up into the air, and getting very soon well under way ; and in full flight the Gadwall is even faster than the mallard, and, as many writers have observed, reminds one much of teal in the manner of flying and the swish-swish of the wings as the flock hurtles overhead, leaving, let us hope, two birds in response to the right and left with which it has been greeted.

When shooting in the old days over the vast jheels in Khulna and Jessore, though teal might and generally did form the majority of the birds got, yet we always hoped that Gadwall would, and it was certainly these birds that gave us the most sport.

In some places the jheels themselves, vast stretches of water, shallow in the cold weather and much overgrown all round their borders with reeds, weeds, and lilies, were surrounded with rice-fields, and through these wandered shallow water-ways, some natural and others artificially made either for draining or irrigation.

Daybreak would see us making our way from one of the main rivers up such a water-way, which we might have to traverse for some two or three miles before reaching the piece of water which formed our destination. Our boats were the light flat-bottomed kundas, or canoes, used so universally all over North-eastern India ; and our seats were low morahs, or cane seats, which enabled us to swing round and get shots to our rear as well as in front and both sides, which a seat right across the boats would have prevented. We had not, however, to wait until we got to the jheel for our shooting, for snipe constantly got up to our right and left and teal rose within shot in a manner far beyond what we hoped for later on ; moreover, the feeding flocks were scattered, and one bird down, another shot might well be hoped for. Here and there, too, a Gadwall would find its way within range, these only getting up from patches of rice more than usually dense and thick. Less often a few pintail would flash across us, but rarely

within shot; also pochards, white-eyes, and shovellers were all to be seen at intervals. Whilst it was still cool and a few wisps of gently quivering mist were still lingering on the top of the water, loath yet to dissolve their ghostly lives into nothingness, we were generally well into the jheel and had scattered out into a long line. Snipe we now allowed to get up unheeded, though as yet they were but few, for not until the sun rose high and hot did they forsake the rice-fields and take to the deep water and the cool shade of lily-leaves. Whistling-teal swarmed in all directions and kept circling round everywhere in countless myriads; purple coots fluttered and fluttered across the tops of the reeds and through the rushes; the little water-rail scurried across the surface of the water-plants; and other undesirable birds, such as water-hens, jaçanas, &c., were in evidence in every quarter. Still the continuous popping of the guns down the line showed that all the birds were not undesirable ones. Constantly amongst the whistlers overhead there would appear a flock of swifter, more quickly wheeling birds, as the blue-wing teal came through them, roused by one of the other boats; or a flock of common teal, flying in much the same manner, would rush down nearly the whole line, a splash or two in the water marking the members of their mess whom they had left behind. The duck, however, got up in front and went straight away, seldom wheeling within reach of even the outermost boats, though now and then a flock sweeping past high overhead would offer a difficult and often useless shot.

The Gadwall, which were generally only in small flocks, were usually found where there was a certain amount of cover, which, assimilated by the green screen on our boats, allowed us often to get within shot. They dive and swim very well when only wounded, and many a ten minutes was spent in retrieving such birds, for whose sake we generally kept a stock of No. 8 cartridges ready at hand to use instead of the No. 4 or 7 we used for others. About 10 a.m. our boats all worked in towards some fixed point, and from about 11 a.m. to 1 p.m. was given over to lunch and a smoke and an examination of the bag. Between 1 and 2 p.m. we would again embark, and the same routine was gone through only reversed, and the shooting back to the rice-fields was the finale of the afternoon's programme.

It was seldom on such days that the three guns who were generally out, could not get their fifty couple of game-birds, by which I mean that whistlers, cotton-teal, and even snipe did not count towards the bag. As a rule, the comparative number of snipe would be small, as they were not shot at except at the commencement and end of the day's shooting; and we always considered the bag good or otherwise according to the number of Gadwall, pintail, and other big duck contained in it.

I have no record now of what we got, but certainly we often got fifteen couple of Gadwall, and sometimes over thirty, whilst on one occasion, I think, the three of us got over forty couples.

The Gadwall did not seem to mind much what sort of water they were in; early in the mornings and late in the evenings they were to be found in the rice-fields—generally, as I have already said, in some corner where the cover was denser than elsewhere; an hour after light they left the rice-fields and were found swimming about in semi-open pieces of water, but seldom in the large open expanses in the centre of the lake. It was very noticeable that in the rice-fields the birds were constantly seen either singly or in pairs, yet as soon as they left these they were very seldom found in pairs, and practically never alone, but in flocks numbering ten to twenty, sometimes as many as forty.

They seem to put on fat quicker than any other duck, or perhaps they feel the exertion of migration less. Of course the mallard, which migrates often from parts very close to us, arrives fat; but I have noticed that early in the season, when other ducks are very poor, the Gadwall is usually in quite a plump condition.



THE WIDGEON
Mareca penelope.
 $\frac{1}{3}$ nat. size

female

male

Genus MARECA.

The genus *Mareca* differs principally from *Nettion* in having a smaller bill, which is distinctly narrower and rather tapering towards the tip; from *Chaulelasmus* it differs in not having the lamellæ of the upper mandible so prominent, and the tail-feathers are more pointed, the central rectrices extending beyond the others.

There are only three species in the genus, of which but one, *M. penelope*, reaches our limits; of the other two, one *M. americana*, is a North American form, whilst the other, *M. sibilatrix*, is a South American bird. All three are much the same size.

(30) MARECA PENELOPE.

THE WIGEON.

Anas penelope, Linn. S. N. x. ed. i, p. 126 (1758) (Sweden); *Hartert, Vog. Pal.* p. 1321 (1920).

Mareca penelope, *Jerdon, B. of I.* iii, p. 804; *Hume, S. F.* i, p. 271; *Butler, ibid.* iv, p. 30; *Hume, ibid.* vii, p. 494; *Davis, & Wend. ibid.* vii, p. 93; *Scully, ibid.* viii, p. 63; *Hume, Cat. No.* 963; *Hume & Marsh. Game-B.* iii, p. 197; *Vidal, S. F.* ix, p. 92; *Butler, ibid.* p. 438; *Reid, ibid.* x, p. 82; *Hume, ibid.* p. 245; *Davidson, ibid.* p. 326; *Oates, B. of B. B.* ii, p. 278; *Barnes, B. of Bom.* p. 408; *Hume, S. F.* xi, p. 345; *Salvadori, Cat. B. M.* xxvii, p. 227; *Blanford, Avifauna B. I.* iv, p. 445; *Stuart Baker, J. B. N. H. S.* xii, p. 236 (1899); *Oates, Game-B.* ii, p. 210; *Hopwood, J. B. N. H. S.* xviii, p. 433 (1908); *Stuart Baker, Indian Ducks*, p. 155 (1908); *Harrington, J. B. N. H. S.* xix, p. 313, 1909; *Hopwood, ibid.* xxi, p. 1220 (1912).

Description. **Adult Male.**—Forehead, crown, and anterior nape pale-buff, sometimes with a few black dots on the nape, remainder of head and neck dull-chestnut, much speckled anteriorly with black, and the chin and

throat more or less black also ; back, sides of neck and upper breast, flanks, scapulars, rump, and shorter upper tail-coverts vermiculated blackish-brown and white, the rump and upper tail-coverts with the white predominating, longer upper tail-coverts black; central rectrices brownish-black, getting paler on each succeeding pair, the outer pairs being also tipped white; upper breast and lower neck and sides of lower breast vinous-red; under tail-coverts black, rest of under plumage white; smallest wing-coverts greyish-brown, more or less vermiculated white; primary-coverts vinous-grey, remaining coverts white; the greater secondary-coverts tipped black; primaries brown, pale-shafted except at the tips; outermost secondaries brilliant metallic-green, broadly edged and tipped black; outer web of next secondary pure-white, edged black; inner secondaries black, edged white, and greyish on the inner webs.

Colours of soft parts.—“Irides deep red-brown; bill grey-blue, livid-blue or bluish-plumbeous, the tip black; legs dusky-lead, lead-grey, or, rarely, greenish lead-colour, dusky on the joints and webs and with the claws dark.

Measurements. “Males (Adults).—Length 19·0 to 19·5 inches, expanse 32·75 to 34·5, wing 10 to 10·5, tail from vent 4·0 to 4·6, tarsus 1·4 to 1·6, bill from gape 1·7 to 1·82. Weight 1 lb. 5 ozs. to 1 lb. 10 ozs.” (Hume.)

During the early part of the cold weather the feathers of the breast have grey edges, which make the whole breast a pale greyish-vinous; as the season progresses the edges wear off, and the breast gets richer in colour in consequence.

Adult Female.—Head and neck pale reddish-brown, richer posteriorly and paler below, speckled with very dark brown; rest of plumage above brown with pale edges to the feathers, varying from almost white to rufous, the scapulars and inter-scapulars more or less barred with the same; smaller wing-coverts like the back, median the same but with broader edges; greater coverts with still broader, paler edges; quills plain-brown; a dull blackish-brown speculum edged by the outer secondaries more or less tipped white, and with the secondary next the speculum having the outer web broadly white; innermost secondaries edged with fulvous. Lower neck and breast reddish-brown, sometimes speckled with darker; lower breast, abdomen, and vent, varying from white to uniform pale, rather bright rufous-buff, the flanks and axillaries darker and often more or less spotted brown. Under tail-coverts the same as the abdomen, but with the feathers centred dark.

Colours of soft parts.—Bill slaty-blue, nail black, the base of the maxilla often darker, the mandible with the commissure, base, and often the tip darker and nearly black. Irides from light dull to deep bright brown; legs grey or drab marked with dusky as in the male.

Measurements.—“Length 17·8 to 19·25 inches, expanse 31·5 to 34·0, wing 9·3 to 10·5, tail from vent 3·5 to 5, tarsus 1·4 to 1·6, bill from gape 1·68 to 1·8. Weight 1 lb. 3 ozs. to 1 lb. 10 ozs. (Note that only one female out of twenty-seven weighed more than 1 lb. 9 ozs.).” (Hume.)

Young Male.—Much like the female, but the upper parts, especially on the rump and upper tail-coverts, more grey than brown, and soon assuming the vermiculated appearance of the adult male; white about the speculum far more developed, as is the speculum itself, and the breast and fore-neck are a richer brown.

Male in the first nuptial state or changing from the young into Adult Stage.—Head rich-brown, boldly spotted with black, less so below; upper back and adjoining parts as in the female, but gradually changing to grey on the lower back and rump, where it is beautifully vermiculated and stippled with white; upper tail-coverts, scapulars and innermost secondaries like the upper back; wing like the adult male, but the speculum inconspicuous; lower parts as in the female, but with the breast a very rich rufous, contrasting both with fore-neck and abdomen.

Nestling.—“May be distinguished by the warm rufous tint of the cheeks and throat and the absence of any loral streak; the upper parts are, moreover, of an almost uniform brown, with hardly any signs of bars on the pinions.” (Yarrell.)

Distribution.—The Wigeon is found throughout Europe at different seasons, being a permanent resident in some of the northern countries; practically throughout Asia, though rare to the east, breeding in the north and wintering in the south; in Northern Africa in the cold weather as far south as Abyssinia, Southern Egypt and to Madeira. It also wanders as far as North-eastern America.

Within our limits it is found practically everywhere except in the extreme south and in Ceylon. I did not personally obtain it in the Sundarbans, but many others have shot it there. It is decidedly common in Cachar and Sylhet to my own knowledge, not rare in Goalpara and Kamrup, in which districts I have shot it, and is found throughout the Province of Assam, whilst in Burma it has been recorded from N. Tenasserim, Chindwin, Aracan and the Bhamo district.

Nidification.—The Wigeon breeds throughout the greater part of its northern habitat, but probably nowhere within the Arctic circle. It is common in Iceland and still more so in Lapland, breeds throughout Northern Europe, and also, I am told, in East Prussia, and it also breeds in North-west Asia, less commonly to the east. In Great Britain it has often been found breeding in Scotland and also in Ireland, and in 1898, Mr. W. J. Clark recorded the finding of a Wigeon's nest in Yorkshire, this being the first record of its breeding within the limits of England itself.

Its nest may be placed either close to water in amongst the growth on the banks or shores, or it is sometimes placed a good distance from it. In Scotland it is frequently found well hidden in amongst heather, far from the nearest water. As a rule, it is very carefully hidden, but at other times it is very conspicuous, and can be seen from a few yards away. The duck sits very close indeed, and, flying up at one's feet, usually shows the whereabouts of the nest, however well it may be hidden. The drake would seem to take little interest in the nest or eggs, and leaves the duck not only to do all the incubation, but also to look after the young until they are some days old.

The nest would appear to differ from other ducks' nests in being better put together in most cases. In some nests the materials—moss, leaves, grasses, and weeds—are well intermingled and interwoven with one another and with down, which not only forms the lining, but is also incorporated in the body of the nest itself. Frequently, on the other hand, the nest is very primitive, and consists of only a few of the materials mentioned, just loosely placed in some hollow in the ground.

Dresser says:—

"The eggs are deposited late in May or early in June, the locality selected for the purpose of nidification being some times close to the water's edge, and at others some distance from it, but Mr. Colley informs me that he found a nest on the fells, not far from the town of Lillehammer, which was under a juniper bush, at least 800 yards from the water. The nest is a mere depression or hole scratched in the ground, and well lined with down and a few feathers, intermixed with a little moss or a few grass-bents. A nest which I possess consists of a little moss matted together with down, the latter being of a dark sooty brown colour, the centre of the down being rather lighter or a dark sooty grey, and a few feathers of the bird are interspersed here and there.

"The eggs are creamy-white in colour and oval in shape, tapering slightly towards the smaller end."

In rather strong contrast to the above "mere depression or hole" is Mr. Wolley's description of a Wigeon's nest:—

"A nest is an extremely pretty sight, even when separated from its native bank, and all the accompaniments of flowers, roots, moss and lichen."

The number of eggs is normally 6 to 8 or sometimes 10. Morris says 5 to 8, Meyer 10 to 12. In colour they vary from a pale-cream, so faint as to appear white, to a rather warm cream or buff, generally the former. Hume's eggs measured 2·1 to 2·3 inches in length, and 1·5 to 1·6 in breadth. The texture is, of course, fine and fairly close, with the surface inclined to be glossy. Incubation is said to last about twenty-four days.

Two eggs in my collection, which come from Lapland, are smaller than any of Hume's, measuring 2·05 × 1·5 inches and 2·00 × 1·45. Both these eggs are also unusually glossy.

General Habits.—It will be noticed that in certain localities in India one person records this duck as being very plentiful, whilst another, who may be an equally good observer and naturalist, says it is never found. This is due to the fact that the Wigeon is most irregular in its visits, and whilst it comes one year in hundreds and even thousands to certain parts, yet these localities may be hunted in vain the following season for a single specimen.

Notes recorded by various ornithologists and sportsmen would seem to show that in years of heavy rainfall the Wigeon does not visit India in the same numbers as it does in drier years.

Thus, Reid writes of Oudh :—

“The Wigeon is by no means uncommon, though it is. I think, rather erratic in its wanderings, being much more common in some seasons than in others. During the past cold weather for instance, when the jhils were much below the average size, and many of the smaller ones altogether dry, I did not expect to meet with it; but as a matter of fact, it was much more common than I had ever known it to be before.”

Again, Vidal :—

“Wigeon, in some years, are very abundant on the Vashishti River, congregating in large flocks of 500 birds or more, but they are not, like Common Teal, widely distributed. In 1878-79, after the highest rainfall on record, not a Wigeon was to be found in the district; but in 1879-80, after a year of moderate rainfall, they reappeared in their usual strength on the Vashishti.”

Davidson notes it as rare in Mysore, but Major MacInroy says that a fair number may be met with in parts. The only way I can at all account for the Wigeon being more common in dry than

in wet seasons is because it is very much of a shallow-water or bottom feeder. In very wet seasons the lakes, jhils, ponds, etc., all overflow their normal limits, and thus the edges of the shallow water cover ground on which no water-weeds grow, and on which the natural dry-land vegetation has been killed by the water. On the other hand, in dry seasons, the water recedes and much jhil vegetation, which, under ordinary circumstances, would be in a few feet of water, is within a few inches of the top, and well within grasp of the duck as it feeds with only its tail-end out of water. It is, of course, a strong and expert diver, but does not feed, I think, on any vegetation which necessitates its going completely under water. Of two birds shot in Silchar, the stomachs contained nothing but the white tendril-like roots of a small water-plant which grows profusely where the water is only a few inches deep, and these the birds could obtain by merely standing on their heads, as it were, in the water. It grazes a good deal, like geese, on young grass, and also on young crops, and, in addition to various other vegetable substances, eats water-snails, worms, insects, and shell-fish of sorts, this more particularly near the sea-coast, where it is often found in brackish estuaries or back-waters.

Morris writes :—

“ This species feeds principally on water insects and their larvæ, small mollusca, worms, the fry of fish and frogs ; and also the buds, shoots, and leaves of plants and grass, and these it browses on in the daytime ; but it chiefly seeks its food in the mornings and evenings, and also at times in the night.”

All ducks, it should be noted, whether as a rule day or night feeders, are inclined to feed freely during moonlight nights, and this is perhaps more especially the case with such as graze on grass and young crops.

Hume says that it is as quick in rising as is the gadwall. I should have given the palm to the gadwall for quickness in getting off the water, but once up the Wigeon is quite as fast in getting away. On the wing it is certainly not as fast as either the garganey or common teal, nor is it as hard to bring down, for it is less densely plumaged, and can carry far less lead.

They vary very much in being wild or the reverse, but, taking them everywhere, in comparison with other ducks they may be said to be cute, wary birds, but falling short in this respect of many of their kind. What adds, too, to the ease of obtaining shots at them is their habit of feeding almost throughout the day, their feeding taking them much to the edges of the jhils and lakes, where they remain amongst the reeds and vegetation. This, of course, hides the stalker and the stalked, and many shots may be obtained at Wigeon by walking round the borders of a lake, whilst most of the other duck are away in the middle of the water, unapproachable, except by boat, and often not by that. They collect in very large flocks, sometimes numbering as many as seven or eight hundred individuals, but more often will be found in flocks of 100 or so, and, of course, where they are less common in small flocks of a dozen or less, often in pairs or singly, but in the latter case always with some other duck.

Of their voice, Hume writes:—

“They are, on the whole, rather loquacious birds, and both when feeding and at rest, when walking, swimming, and flying, often utter a shrill ‘whew,’ a sort of whistle by which you may know them at any distance; it is not a clear full whistle like the Curlew’s, but a whistle-cry, rather discordant when heard by day, but not without its charms when uttered by night by large numbers, mingled with the call of many other species and mellowed by the distance and the multitudinous voices of wings and water.”

They fly with a swift powerful flight, generally in line formation, the line nearly always irregular, and altering much in shape as the birds fly; the two ends are generally thin, whilst towards the centre the birds are more numerous. When flying from one jhil to another, or when put up by shots, they do not, I think, take any particular formation.

Meyer says:—

“The Wigeon fly in the usual manner of ducks, following one another; but these birds fly so very close upon the heels of their leader, that it forms a distinguishing peculiarity.”

Hume notes the peculiar rustle made by the Wigeon in flying; this is very distinctive, and when close at hand sounds very different from the swish of the mallard or the sound of other ducks’ flight.

In England they are caught in large numbers by decoys, which induce the wild birds to enter some small waterways roofed in with wire netting, which gradually lead to a large drop-net in which they are entangled. The placing of the pipes—as the leading tunnel-nets are called—is the main feature of the trap, as these have to be so made that they are quite inconspicuous, and the entrances must be natural ones. Sometimes a small dog is trained to dodge about the pipes, continually showing itself high up the pipe for an instant or two and attracting their curiosity, which is a strong trait in all ducks. In Goldsmith's 'Natural History,' a little volume dated 1830, it is said that "in only ten decoys in the neighbourhood of Wainfleet, so many as 31,200 have been caught in a season." This, of course, refers to all kinds of ducks, not to Wigeon only.

To eat, the Wigeon is sometimes first-rate, sometimes decidedly fishy and rank. At home it is considered quite one of the higher class of ducks for eating, but out in India it is often *not* of a higher class; Hume says of some he got on the sea-coast that they had such distinct "odour of brine from the ocean" about them that they were quite unpalatable. Those shot in Cachar and Assam I have always found very good indeed.

Genus NETTION.

The genus *Nettium* or *Nettion* is one of the largest in the order *Chenomorphæ*. As restricted by Salvadori, there are seventeen species contained in it, of which three only are found in India. The range of the genus is cosmopolitan, and it contains species both resident and migratory, both of which are represented in India.

The differences between *Nettion* and *Anas*, *Chaulelasmus* and *Mareca* have been already pointed out.

Key to Species.

Speculum, secondaries bronzed green at base, then black and tipped white, and with their coverts tipped rufous . . . *N. formosum*.
Speculum, outermost secondaries black with white tips, those next them brilliant metallic-green, next again to them one black, the remainder like back *N. crecca*.
Speculum, outer secondaries black except two or three in the centre (7 to 9), which are bronzed-green *N. albogularis*.

(31) NETTION FORMOSUM.

THE BAIKAL OR CLUCKING-TEAL.

Anas formosa, *Georgi*, *Bemerk. Reise. Russ. Reich.* p. 168 (1775) (Sweden); *Hartert, Vog. Pal.* p. 1316 (1920).

Querquedula glocitans, *Jerdon, B. of I.* iii, p. 808; *Hume, S. F.* viii, p. 412.

Querquedula formosa, *Hume, S. F.* iii, p. 494; *id. ibid.* viii, pp. 115, 494; *id. Cat. No. 960*; *Hume & Marsh. Game-B.* iii, p. 225; *Barnes, B. of Bom.* p. 411.

Nettion formosum, *Salvadori, Cat. B. M.* xxvii, p. 240; *Stuart Baker, J. B. N. H. S.* xii, p. 243 (1899); *id. Indian Ducks*, p. 162 (1908); *Lindsay Smith, J. B. N. H. S.* xix, p. 525 (1909); *Monahan, ibid.* p. 526; *Gore, ibid.* xxi, p. 1090 (1912); *Evans, ibid.* p. 1091; *Higgins, ibid.* xxii, p. 399 (1913); *Osmaston, ibid.* p. 548 (1913); *Higgins, ibid.* xxiv, p. 605 (1916).

Nettium formosum, *Blanford, Avifauna B. I.* iv, p. 442; *Oates, Game-B.* ii, p. 182.

Description. Adult Male.—“Crown of the head, back of the neck, entire throat, and a band extending from the eye across the face to the throat, black; face and neck on the sides and under the throat buff, the buff parts margined narrowly with white; also the black crown from behind the eye is bordered on each side with a white band which runs down the sides of the black nape, and spreads on the sides of the neck; from behind the eye a broad, glossy-green band of a crescentic shape passes along the sides of the head and interiorly changes into black, between the buff colour anteriorly and white band posteriorly; back and scapulars grey, somewhat tinged with brown, minutely vermiculated with black; the inner scapulars elongated, lanceolate, on the outer web black, edged with cinnamon, silky-buff, edged with brown, on the inner web; lower back and rump greyish-brown; the upper tail-coverts brown, edged with rufous; lower neck and upper breast vinous, marked with small oval black spots; on the sides of the breast, just before the bend of the wing, a crescentic white band; lower breast and belly white; flanks grey, minutely vermiculated with black; under tail-coverts black, but marked with bay on the sides, the longer ones whitish-buff at the tip, with slight vermiculation; on the lower flanks, just at the base of the tail, a band of silky-white, formed by the tip of the feathers; wings pale greyish-brown; the last row of the upper wing-coverts tipped with cinnamon, forming a band which borders anteriorly the wing-speculum;

the latter is glossy-green anteriorly, with a subapical velvety-black band, and bordered by a white band at the tip of the secondaries, the longer tertaries marked with velvety-black on the outer web; quills pale-brown; under wing-coverts brown-grey, the greater ones pale-grey, the centre ones and the axillaries whitish, minutely spotted with brown-grey; bill dark bluish-brown; feet light greyish-blue, darker on the web; irides chestnut-brown."

Measurements.—"Total length 18 inches, wing 8·5, tail 4·2, culmen 1·5, tarsus 1." (*Salvadori.*)

"Length 15·8 inches, wing 8·15, tail 3·9, tarsus 1·3, bill at front 1·5, from gape 1·92." (*Hume.*)

"The tarsus in a fine male from China is 1·4 inches." (*Hume.*)

Again, Temminck and Schlegel give the dimensions of the tarsus as 1·28 inches.

Of the four specimens in the Indian Museum, Calcutta, the measurements of the tarsus of the males are 1·2 to 1·3 inches; the measurements were kindly supplied to me by Mr. F. Finn.

Female.—"Upper parts, wings, and tail brown, with paler edges to the feathers, crown darkest; speculum as in the male, but the rufous and bronze-green bands duller; a buff spot on each side of the head in front of the lores, another under each eye; side of the head and neck buff or pale rufous speckled with brown; lower parts white, except lower fore-neck and upper breast, which are light rufous-brown with dark spots.

Measurements.—"Length 15·0 inches, culmen 1·45, wing 7·8, tail 3·5, tarsus 0·9." (*Dresser.*)

"The only female in the Indian Museum, Calcutta, has a tarsus measuring 1·3 inches." (*Hume.*)

Post-nuptial plumage.—"The male assumes, after breeding, a plumage very similar to that of the female, from which he is only to be distinguished by the darker brownish-red tint of the upper breast, and the comparatively uniform colour of the upper back, the feathers of which, in the female, are darker and very conspicuously bordered with reddish-buff." (*Hume.*)

Young.—"The young in down are easily recognized by the spot at the root of the bill and the stripe by the eye, which agree exactly with those of the female, but are yellowish instead of white." (*Middendorff.*)

Distribution.—Roughly speaking, the habitat of the Clucking Teal may be said to be the eastern portion of Asia, south of the 70th degree north latitude, and east of longitude 80 degrees. To the south its boundary may be taken as the 20th degree latitude. It is extremely common in many parts of Southern China, Central East China, Formosa, and the south of Japan in the winter, but it has at no time been reported from Yesso or elsewhere to the north of

Japan. The extreme north of China, Mongolia, Manchuria, and perhaps Korea, it seems only to visit on migration, its summer home being northern Asiatic Russia and Siberia.

Salvadori says that it "straggles into the western Palaearctic region (Italy and France)." And, again, in Latham's 'General Synopsis of Birds' (1780), I find the following under the heading of *Anas glocitans* :—

"Taken in a decoy in England. Has also been met with along the Lena and about the Lake Baikal. Has a singular note somewhat like clucking."

Within Indian limits its occurrence has been of the rarest. Blyth got a male in the Calcutta bazaar. Colonel McMaster says that he got what he believed was a specimen of this species in the Upper Sircars. Mr. E. James had a painting of the head of a teal, said to have been shot in Sind, which was undoubtedly—the painting—that of this species. In November, 1879, Mr. Chill got a male Clucking Teal about thirty miles south of Delhi; this he preserved and sent to Hume. Thus up to Hume's time the records of its actual occurrence are but two in number and of its possible occurrence but two more.

Since then ten more specimens have been obtained. On the 16th December, 1898, Mr. E. L. Barton, of Bombay, shot a male Clucking Teal about twenty miles from Ahmedabad, in Guzerat, and the skin is now in the collection of the Bombay Natural History Society.

Colonel Row, 8th Goorkhas, shot one in the Dibrugarh district of Assam; Messrs. Eden and Harrison each shot one in Eastern Assam in 1912; Higgins obtained one in Manipur in 1913, and a second in 1916; De Vitre had two trapped birds brought to him in Behar in 1907; Aitken obtained one in Lyallpur in 1909, and finally Hope-Simpson shot one in Goruckpore in 1913.

Nidification.—As regards the breeding, the two notes quoted by Hume are all there are on record.

Middendorff says :—

"Although the commonest duck on the Boganida (70 degrees north latitude) it did not occur as far north as the Taimyr River. It was not observed before the 12th June on the Boganida. On

the 3rd July we found a nest on the river bank under a willow bush containing seven fresh eggs. On the 24th of July the young in down began to exhibit feathers on the head, shoulder and wings, but were still unable to fly on the 4th August. On the 28th July a male was shot which had lost its perfect plumage. The latest birds were seen on the 23rd August on the Boganida. This bird was similarly plentiful on the Stanaway Mountains (Aim River). And at Udkoj-Ostrog, where it arrived during the first week of May. . . . The eggs are bluish-yellow in colour and small—the smallest was 1·98 inches long by 1·4 greatest breadth."

Of course, Middendorff meant *largest*, not smallest, as he gives the greatest breadth, and 1·98 inches seems big for the egg, not small. In the lines above quoted the point which will be most quickly noticed is the extremely brief breeding-season. Thus, although the 12th of June is the earliest date on which the bird was seen, yet the last disappeared on the 23rd August, giving little over two months for the whole business of making the nest, laying the eggs, hatching—which we may presume would take up from twenty to twenty-five days—and bringing up the young. As it would take some ten days to lay the normal clutch of eggs and about five at least to make the nest, the only conclusion is that once hatched the young take well under the month to arrive at their full powers of flight. As this is not quite likely, it is probable that though no birds were *seen* before the date mentioned, yet many must have arrived in late May; and when we look at the date when they arrive elsewhere, this is the most probable solution.

In the Amur they arrive and breed very much earlier. The only egg of this duck in my collection is one of many I owe to the generosity of Herr M. Kuschel, of Breslau, who has given me one bearing the date 28th April, 1895. The early date of this egg supports the idea that they must breed earlier than in June in Northern Siberia also.

The egg is a typical teal's egg, the texture very smooth and fine, but without any gloss; the shape oval, with one end decidedly smaller than the other, though obtuse; the colour is a very pale creamy café-au-lait. In size it is two inches long by 1·87 broad, which makes it a rather longer, yet at the same time a rather narrower, egg than those hitherto described.

Taczanowski thus describes a clutch of eggs sent him by Dybowski from Darasan, where this teal breeds in numbers:—

“They are somewhat larger than those of the Garganey; their colour is a pale greyish-green, very like that of the eggs of the mallard. They vary from about 1'8 to 1'9 inches in length, and from about 1'3 to 1'4 in breadth.”

General Habits.—Information of this duck's habits is meagre in the extreme and I can find practically nothing of interest.

Its flight is said to be swift and teal-like, but instead of, like the Common Teal, flying at great heights when on migration, it flies low and close to the surface of the country. This habit of flight, however, is probably only a distinctive feature as the Clucking Teal approaches its destination, for Prjevalsky writes:—

“When migrating these ducks fly very low, following the plains which abound with lakes, and as soon as one is perceived which is not frozen, they at once settle down on it.”

Most noticeable of all its characteristics is the voice. These teal are, especially the drakes, noisy birds, constantly uttering a strident, clucking call, like the syllable “mok” repeated very quickly. I have heard their cry likened to the Cotton-Teal's, as uttered by the latter bird when flying, but far louder and more distinctly syllabized.

The voice has also been likened to that of an old hen, and a consignment of these birds kept on board a vessel from Shanghai made a noise continuously, so much like a number of fowls that the passengers would hardly believe that the clucking came from the throat of any duck.

As a rule, it would appear that it is an inland bird, keeping much to the swamps and morasses, or to rivers, and less often to large open sheets of water. In Japan and Formosa it has been seen on the sea-coast, in tidal creeks, and, I believe, even on the sea-shore itself.

It is a shy bird and difficult of approach as a rule, but appears to become less so during the breeding season. Ruddle says that he saw in company, “in a small morass above the Udir rivulet, *Anas boschas*, *A. crecca*, *A. glotinans*, *A. clypeata*, *A. acuta*, and a few of *A. penelope*, sitting quietly close together after a meal, resting.”



female

THE COMMON TEAL.
Nettion crecca crecca.

$\frac{1}{3}$ nat. size

male

(32) NETTION CRECCA CRECCA.

THE COMMON TEAL.

Anas crecca, Linn. S. N. x. ed. p. 125 (1758) (Sweden); *Hartert, Vog. Pal.* p. 1814 (1920); *Leyge, B. of C.* p. 1083.

Querquedula crecca, *Jerdon, B. of I.* iii, p. 806; *Hume, S. F.* i, p. 262; *Adam, ibid.* p. 402; *Butler, ibid.* iv, p. 30; *Hume & Davis, ibid.* vi, p. 489; *Davids. & Wend. ibid.* vii, p. 93; *Bull, ibid.* p. 232; *Hume, ibid.* p. 494; *id. Cat. No. 964*; *Scully, S. F.* viii, p. 368; *Hume & Marsh. Game-B.* iii, p. 205; *Vidal, S. F.* ix, p. 93; *Butler, ibid.* p. 438; *Reid, ibid.* x, p. 83; *Davids. ibid.* p. 413; *Taylor, ibid.* p. 467; *Oates, B. of B. B.* ii, p. 285; *Barnes, B. of Bom.* p. 409; *Hume, S. F.* xi, p. 346.

Nettion crecca, *Salvadori, Cat. B. M.* xxvii, p. 243; *Stuart Baker, J. B. N. H. S.* xii, p. 247 (1899); *id. Indian Ducks*, p. 167 (1908).

Nettium crecca, *Blanford, Avifauna B. I.* iv, p. 443; *Oates, Game-B.* ii, p. 172; *Ward, J. B. N. H. S.* xvii, p. 948 (1907).

Description. Adult Male.—“A broad band from the back of the eye down the nape and upper neck, metallic-green, sometimes glossy-black posteriorly; a narrow white line from the base of the maxilla, running upwards over the eye and the green band, and another from the fore-corner of the eye running under the green band; the remainder of the head and neck rich, rather dark, chestnut; the point of chin or whole chin and edge of lores more or less black; lower neck, upper back, inner scapulars, sides of vent, and flanks vermiculated dark brown and white, the vermiculations on the upper part increasing in breadth towards the breast, on the sides of which they become bold black and white bars, and in the middle of the breast merely round black centres to the feathers; remainder of back brown, sometimes slightly vermiculated at the sides; rump brown, the feathers edged paler; upper tail-coverts rich-brown, edged buff; rectrices brown, edged paler; lower surface white; under tail-coverts buff at the sides, black in the centres; greater coverts broadly edged white or buffy-white; remainder of coverts and primaries grey-brown; outermost secondaries black, edged narrowly white, the next three or four metallic-green, and the one next again to them black with a very narrow white margin; the remaining innermost secondaries a beautiful silvery-brown, and the outermost scapulars buff, with broad velvety-black diagonal edges.”

Colours of soft parts.—“In the adult the bill is black or blackish, brownish on rami of lower mandible.

“Irides are brown, varying in shade from light hazel to almost black.

“The legs and feet are commonly grey with a faint olive tinge (the webs and claws in all cases dusky), but they vary in shade a little and at times are bluish-grey with a brown shade, and at others a distinctly dark slaty-grey, sepia-grey, brown, greyish-brown, olive, greenish olive, dirty greenish plumbeous, or even plumbeous.” (*Hume.*)

I have found a green tinge on the tarsus and toes very common, indeed more so than a pure grey or plumbeous.

Measurements.—“Length 14·5 to 15·85 inches, expanse 23·0 to 25·25, wing 7·2 to 8·0, tail from vent 3·0 to 3·6, tarsus 1·0 to 1·2, bill from gape 1·5 to 1·77. Weight 7·7 ozs. to 12·0 ozs.” (*Hume.*)

“Total length 14·5 inches, wing 7·25, tail 3, culmen 1·6, tarsus 1·1.” (*Salvadori.*)

Adult Female.—Upper parts dark-brown, the feathers edged rufescent white; lores, throat, and neck rufescent-white, with speckly brown centres to the feathers, larger and more distinct on the neck; chin and fore-throat the same but unspotted; flanks and breast more or less with dark centres to the feathers, always fairly defined on the former, but sometimes practically non-existent on the latter, though, on the other hand, they sometimes show up as distinct dark-brown drops; the ground-colour of the lower parts may be anything from almost pure white to a distinct rufous or buff; scapulars like the back, but generally more richly coloured, remainder of wing like that of the male, but with the speculum usually duller.

Measurements.—“Length 13·5 to 14·9 inches, expanse 22·5 to 25, wing 6·5 to 7·4, tail from vent 2·9 to 3·5, tarsus 1·0 to 1·2, bill from gape 1·5 to 1·77. Weight 7·7 ozs. to 12 ozs.” (*Hume.*)

Colours of soft parts.—“In young males and females the lower mandible, though sometimes only brown, commonly varies from brownish-yellow to dull orange, and is generally brownish at tip. The upper mandible also in females is usually rather paler coloured than that of the male, and is often tinged with green or plumbeous green.” (*Hume.*)

Legs and feet are also more often tinged strongly with sienna than are those of the male. The irides are the same—light to dark brown.

After the breeding-season, or when the eggs have been laid, the males assume a plumage similar to that of the female, but have the upper parts more a uniform brown.

Morris says:—

“The male assumes the plumage of the female in summer by the end of July or beginning of August, and this he retains until the general moult.”

The young are like the female, perhaps rather darker in general hue, but have the pale edgings to the upper feathers more pronounced, and the spots and bars on the lower plumage more numerous and distinct, the

former showing often in the centre of the abdomen and the latter on the under tail-coverts.

The Nestling "is yellowish-white on the under parts, buff on the forehead and throat; a dark-brown streak from the forehead to the crown, which, with the upper parts, is brown; a dark loreal streak, and two other streaks from behind the eye to the nape, on each side." (Yarrell.)

The drakes, when they arrive in India, are often in a beautiful transition-stage, and few will be found in perfect male plumage before January. I have a most handsome young male in my collection which is a very good example of the changing plumage; above, it is like the female, but without the broad edgings to the feathers, and on the rump and upper tail-coverts are a few feathers showing the beautiful black and white vermiculations. The head is dark-brown with the merest trace only of the black eye-streak; the under plumage is pure white, but all along the flanks, vent, and under tail-coverts, and here and there on the abdomen, are still left feathers of the old plumage, which are a bright rufous-buff. The new feathers of the flanks are like those of the adult male, and the breast is beautifully spotted with distinct oval drops; the upper breast and neck are a dull rufous.

From the above description, it may be seen that it does not follow that because one year a bird has rufous or rufescent plumage, he will have the same again after the next moult. In the bird just described the new plumage is a very pure white, but the old patches are exceptionally bright rufous. From this we might infer that the habitat and its water have much to do with the colouration of the lower parts, yet a female in new plumage shot with this young male is very rufous indeed.

Distribution.—The Common Teal extends through the Palæarctic region in the summer, breeding as far south as the 40th degree north latitude, and migrating south during the cold weather into northern Africa as far as Abyssinia on the east, and Wadan on the west, practically the whole of southern Asia, and the Atlantic coast of North America. It occurs, though rarely, in Greenland.

In British India it is found everywhere with very few exceptions. From the extreme north down to Cape Comorin it is very abundant, though perhaps more so to the north than to the south, but even there it is spoken of as appearing in flocks of hundreds.

Hume gives the exceptions to its habitat as follows:—

"The Laccadives, the Andamans, and Nicobars, Tenasserim, Southern, Central, and North-East of the Salwein, and possibly Malabar."

From these places must now be struck off the Andamans, Nicobars, and Malabar, the bird having been found frequently in the latter place since 'Game-birds' was written.

In Legge's 'Birds of Ceylon' it is said not to occur in the Philippines, but lately I have heard that it has been met with there also.

Nidification.—Teal have on so many occasions been found at different times between June and August in India, that ornithologists have been always kept in a state of semi-expectation that their nests would be found somewhere within our Indian limits, either in Kashmir or some of the Himalayan lakes. Still time has gone on and no such nest has yet been taken, and, personally, I think it is unlikely one ever will be. Amongst the many thousands of Teal shot annually, it would be strange if some few, whilst escaping death and even severe wounds, did not receive internal injuries, invisible themselves after a brief period, yet quite sufficient to incapacitate the birds from migration. This would be quite enough to account for the few birds met with at abnormal times; and though these might appear strong and robust on the wing, yet it does not follow that they were equally so a week or ten days before they were noticed.

They breed practically over the whole of their northern habitat as far south as the 40th degree, but in the southern portion of this range they only breed here and there in very small numbers. They breed freely in northern England and in Scotland, though seldom in the southern counties; yet they have been recorded at this season, and their eggs have been taken in Spain, Greece, North Italy, and South Russia.

They breed very rarely in Greenland, plentifully in Iceland, but not much in the extreme north of Europe, and probably not at all in the extreme north of Asia. Throughout Southern Siberia, Manchuria, and the Amur a great number breed, and a few also in the north of Japan.

They generally make their nests at the edges of swamps and other pieces of water, often where there is actually a little water standing, and even where they make them at a distance from any water the site chosen is nearly always a wet and boggy one. Thus,

in Scotland they sometimes breed on the moors in amongst the heather, but they always select some dip which keeps more or less damp and where the water may occasionally collect.

The nest is a large unshapely mass of vegetable stuff, rushes, weeds, and such-like, lumped together in a mass, with a depression in the centre containing a thick lining of down.

In Finland, Dresser found the nest placed under bushes or in clumps of grass, often at some distance from the water.

Legge's note on the nesting of this Teal is so complete, yet short, that I reproduce it here. He writes:—

"This species breeds in May and June, resorting to extensive marshes, heaths near water, and large peat bogs. The nest is made on the ground among grass or rushes or in thick heather, in which latter case it is placed sometimes in the middle of a clump, and so entirely concealed from view that the bird cannot be seen on its nest. The nest is made of dead flags, rushes, grass, reeds, etc., with a capacious interior, which is amply lined with down plucked from the bird's breast. The number of eggs varies from eight to fourteen, and occasionally as many as twenty have been found in a nest; they are small for the size of the bird, oval, but slightly more obtuse at one end than the other, of a uniform creamy white or pale buff. There is a greenish variety sometimes found, very like the pintail's eggs. A series before me from the Petchora, taken by Mr. Seeböhm, varies in length from 1·58 to 1·7 inch, and in breadth from 1·16 to 1·27. The old birds are said to manifest great affection for their young. Macgillivray relates an instance of his finding a brood of young with their mother on a road; and when he took them up to put them to a pond close by, whither he thought the old bird was leading them, she followed him, fluttering round him within reach of his whip.

"The 'nest-down' is dark brown, with pale whitish centres, but no pale tippings."

This bird is said to be a resident in Egypt according to Capt. Shelley and von Heuglin, and to be very plentiful there.

I have two clutches of eggs which seem to average a great deal longer than most. The two clutches, twelve eggs, average 1·76 x 1·31 inches, the longest being 1·83, and the broadest 1·32. In shape they are broad ovals, very regular, yet all perceptibly smaller at one end than at the other. A few eggs are rather longer comparatively, and these generally have the smaller end rather

more compressed. The texture is fine, close, and smooth, and in some cases has a faint gloss. All my eggs are a pale buff, and vary hardly at all in depth of colouring.

Hartert gives the average size of 100 eggs as 44.65×32.68 mm. ($= 1.76 \times 1.40$ inches).

General Habits.—Hume seems to think that *Querquedula querquedula* arrives in India earlier, if anything, than the present teal, but further observations have shown them to arrive at much the same time, though one year the Garganey may be first and the next year the Common Teal.

In 1898 I had quite numerous records of their arrival in northern India and Assam in August, the earliest being that of a small flock seen on the 22nd of that month. Hume says:—

“In the more northern plains portions of the Empire, though a few are seen during the latter half of September, and exceptional cases have been reported of their appearance some weeks earlier even than this, I think we may say that the first heavy flight arrive during the first week of October.”

Hume, I think, refers in this paragraph mainly to North-east and Central India, and it would therefore really seem as if the Common Teal were earlier in northern Bengal than in most parts, reversing what is the usual rule with most, if not all, other migratory ducks. By this I do not mean to say that the Teal are all with us by September, even in the northern parts of Assam, but I do mean to say that by the middle of that month they are quite common in many parts and in some are fairly numerous by the second week.

It is possible, indeed probable, that our eastern birds are those which come from China; and as they breed there as far south at least as the 40th degree latitude, they have not nearly so far to come as those which travel from the west, few of which really come from further south than about the 50th degree.

Teal are extremely variable in the numbers in which they collect. Often they may be seen singly or in pairs, and at the same place flocks may be seen numbering their hundreds, even thousands. The largest flocks appear to be met with in Sind and the north of the North-west Provinces and the Punjab, and perhaps Northern Rajputana. In these places they are to be seen literally in flocks of

many hundreds, and frequently of thousands. In the Sunderbands I think I have seen as many as 500 in a flock; on the famous Chilka Lake I have been told of their rising in vast flocks which must have been nearly 8,000 strong, and from other parts of India reports are given of flocks numbering hundreds.

The most common-sized flock all over their range may be somewhere between twenty and forty, and in Southern India—i.e., from Mysore to Ceylon—anything over the latter number is rare, though even in the island Mr. G. Simpson, as quoted by Legge, says:—

“In the Island of Delft, and at the Palverainkadoo Lagoon, on the north-west coast, it appears yearly in thousands in November, leaving at the end of February.”

The Common Teal is one of the most attractive of the duck tribe to the sportsman, both from its being so numerous and from its habits. Although mainly a night-feeder, yet in places where its food supply lies in the flooded rice-fields and the edges of swamps, bhils, &c., it will continue to feed for an hour or so after daylight, and even when it has finished feeding it remains in amongst the weeds, reeds, and other cover near the shores. It thus affords excellent sport, whether with a dog or two, or a few beaters, or from some small dug-out poled quietly along by a single man in the stern. The Teal often lay close enough to allow of constant shots at from twenty-five to forty yards, and as they often scatter a good deal, even when resting, two or three shots may be obtained at the same flock. In this way, on large sheets of water, a good bag may be made before the birds get scared and leave altogether, or else rise far out of shot.

Nowhere in Bengal have I found Teal to be of a very confiding nature, but that they are so in some parts of their Indian habitat is well-known. Hume writes:—

“They are, as a rule, when met with near villages, or in densely populated portions of the country, excessively tame—too tame to render shooting them possible, unless you merely require them for food. Not only will they let you walk up to them when they are on a village pond—as close as you please—but when you have fired at them and killed two or three the remainder after a short flight will again settle, as often as not, well within shot. Nay, at times, though fluttering a good deal, and looking about as if astonished, they will not rise at all at the first shot, despite the fact that some of their comrades are floating dead before them.”

In open waters, such as rivers, etc., and when on the wing, Teal often fly bunched and close together, and form shots which much encourage the habits of shooting *into the brown*, quite small flocks often providing from half-a-dozen to a dozen Teal to a couple of barrels of an ordinary smooth-bore. Of course, *even into the brown* one must hold fairly straight, as the Teal yields to no duck in the speed of its flight, in addition to which the sudden sweeps and turns the flock take often disconcert the gunner.

They stand a fair amount of shot unless hit well forward, when a single pellet of No. 6 or 7, or even of No. 8, may suffice to bring the bird to bag.

Hume says that they swim easily, but not very rapidly, and that they cannot dive to much purpose.

Whilst agreeing with his estimate of their swimming powers, I can hardly, however, do so with that of their diving. If shot in open water, they can be brought to hand easily, for they do not dive for long, and not particularly quickly; but if shot amongst reeds they are wonderfully smart in hiding and in dodging in and out amongst them, as also in secreting themselves while holding on to the reeds so that they lie entirely under the water, except the tips of their bills. I found that in the Sundarbans they nearly always made for the water-lilies, hiding under one of the huge leaves.

They walk well, and can even run if necessary; but they do not care for the land, nor do they rest on it, but on the water where there is cover. They rarely feed on really dry land, but frequently in paddy-fields, etc., where there are a few inches only of mud and water. As already said, they are principally night feeders, but where quite undisturbed, they feed during all but the hottest hours of the day, say from eleven a.m. to about three p.m. Their food is undoubtedly mainly vegetable, but they do not despise worms, insects, etc., which may come in their way. For the purpose of obtaining food their diving is said not to extend beyond the peculiar semi-dive so much indulged in by the domestic duck, which leaves the tail-end well out of water.

They are excellent eating, and, however poor in condition they may be, never seem to get an objectionable flavour; so good are they

to eat, indeed, that they are often kept in tealeries in western and northern India, so as to be available during the hot weather and rains. I have no personal knowledge of such tealeries, and, as Hume's account of what they should be is about as full and good a one as it is possible to have, I must again indent on that much-quoted author. He says:—

“Fresh water, and plenty of it, is the first requisite, and, to ensure this the Tealery should always be located near the well, and every drop of water drawn thence for irrigating the garden made to pass through it. The site should be, if possible, under some large umbrageous trees, such as we so commonly find near garden wells, and to the east of the trunk, so that the building may be completely protected from the noontide and afternoon sun. You first make a shallow masonry tank; twelve feet by eight and ten inches in depth is amply large. Four feet distant from this all round you build a thick mud wall to a height of three feet from the interior. The whole interior surface of this wall and the flat space between it and the tank must be lined with pukka masonry and finished off with well-worked chunam. The great points to be aimed at are to have the whole lower parts so finished off as to be on the one hand impregnable to rats, ichneumons, and snakes; on the other, to present no crevice in which dirt, ticks, and other insects can lurk. Outside the walls must be quite smooth, so that no snakes can crawl up them. On the wall you build stout square pillars, four feet high, on which you place a thick pent thatched roof. At the spring of the roof you stretch inside a thin, rather loose ceiling-cloth, to prevent the birds hurting their heads when they start up suddenly, as they will at first, on any alarm, and especially when the sweeper goes in to wash out the place. The interspaces between the pillars you fill in with well-made cross-work (Jaffri) of split bamboo, except one of them, in which you place a door of similar work made with slips of wood. You must arrange that all the water both enters and leaves the building through gratings impervious to snakes and like marauders. Two or three feet outside the walls run a little groove, a ditchlet, in which plant early in the year mulberry cuttings, which will form a good hedge round the place and keep the sun and hot winds off the building; but this must be kept neatly trimmed inside, or it would interfere with ventilation, and must not be allowed to get higher than the eaves.

“Into such a building in February or March you may turn 200 Teal, some Common, some Garganey, as you can get them. A few Gadwall and Pin-Tail will also do no harm, but they do not thrive so certainly as the Teal; and the Garganey, though very good, is not equal for the table to its smaller congener.”

(33) NETTION ALBICULARE.

THE ANDAMAN TEAL.

Mareca punctata, *Ball*, *S. F.* i, p. 88.

Mareca albicularis, *Hume*, *S. F.* i, p. 303.

Mareca gibberifrons, *Hume*, *Nests and Eggs*, p. 644; *id. Cat.* No. 966, ter.; *Hume & Marsh. Game-B.* iii, p. 243; *Hume, Nests and Eggs* (Oates' ed.), iii, p. 290.

Nettion albiculare, *Salvadori*, *Cat. B. M.* xxvii, p. 257; *Stuart Baker*, *J. B. N. H. S.*, xii, p. 257 (1899), *id. Indian Ducks*, p. 175 (1908).

Nettium albiculare, *Blanford*, *Avifauna B. I.* iv, p. 444; *Inglis*, *J. B. N. H. S.* xv, p. 525; *Wilson*, *ibid.*; *Osmaston*, *ibid.* xvii, p. 491; *Oates*, *Game-B.* ii, p. 158.

Description. **Adult Male.**—“Upper part of the head brown; this colour covers also the upper parts of the cheeks and gradually changes into the white of the lower part of the cheeks and throat; the brown of the cheeks with obsolete dusky streaks; round the eyes there is a ring of white feathers, broader below; in some specimens on the lores or at the base of the bill there are some white feathers; upper parts brown; the edges of the feathers of the back and scapulars pale-brown; rump uniform; the feathers of the breast and abdomen pale-brown in the centre, and broadly margined with brownish fawn-colour, producing a mottled appearance; under tail-coverts brown, almost uniform; upper wing-coverts dark-brown, greater or last row of wing-coverts white, forming a band, diminishing in breadth and tinged with brown inwardly; speculum velvety-black, with a longitudinal coppery-green band in the middle, from the seventh to the ninth secondary, and bounded at the tip by a buff band; the first secondary broadly white on the outer web; tertials broadly velvety-black on the outer web; primaries brown, with an olive lustre; under wing-coverts brown, the median ones tipped with white; axillaries white; tail brown.” (*Salvadori*.)

Colours of soft parts.—“Legs and feet greenish-blue to plumbeous; webs usually darker; claws horny; bill greenish-blue, plumbeous or plumbeous-blue, nail black; in some, the lower mandible tinged with, in one the terminal two-thirds of this, pink; irides reddish-brown to deep brownish-red.”

Measurements.—“Length 16 to 18 inches, expanse 24·5 to 27, tail from vent 4 to 4·2, wing 7·5 to 8, tarsus 1·3 to 1·4, bill at front 1·4 to 1·5, from gape 1·7 to 1·8, wings when closed reach from 2 to 2·2 from end of tail. Weight 1 lb.” (*Hume*.)



THE ANDAMAN TEAL.

Nettion albigulare.

$\frac{1}{3}$ nat. size.

"Rectrices 16." (Blanford.) This refers to male and female.

Female.—"Similar to the male, but smaller, and the lower surface duller, and the centerings of the feathers less marked, the green band on the wing speculum more coppery. Total length 15·5 to 16 inches, wing 7·25 to 7·4, culmen 1·3 to 1·35." (Salvadori.)

Measurements.—"Length 15 to 16 inches, expanse 24 to 25·5, tail from vent 3·25 to 3·5, wing 7·1 to 7·4, tarsus 1·25 to 1·35, bill at front 1·3 to 1·4, wings when closed reach to within from 1 to 1·75 of the end of the tail. Weight 12 ozs." (Hume.)

"Young birds are similar to the females, but the dusky markings of the under surface are even less distinct." (Salvadori.)

A young bird caught by Mr. Butler, and described by him in a letter to me was:—

"Similar to the adult, except that the ring round the eye was very narrow and tinged with fulvous. Bill and feet as in adults: eye dark-brown instead of reddish-brown."

Distribution.—This teal is confined to the Andaman and Cocos Islands, but Mr. C. W. Allan shot a specimen at Bassein, Burma, which was found amongst a flock of whistling teal, on the 15th April, 1898. This bird was recorded in the 'Asian,' and Mr. F. Finn wrote to me that he identified the skin himself, and without any doubt it was that of an Andaman Teal. Nothing was noted as to whether the specimen was a drake or a duck. It was probably driven on to the Burmese coast during some storm, having ventured too far out to sea from the Andamans.

Commander N. F. Wilson has procured specimens of this little duck on the Great Cocos, and again on Landfall Island. He remarks:—

"I have always found the birds wherever a fresh-water lagoon existed, and I do not think that there is any doubt that the bird is general, both on the Andaman and Cocos Islands wherever the above conditions exist."

Nettion gibberifrons, *N. castaneum* and *N. albiculare* are very closely allied; for a long time the first and the last were confounded with one another, and even now it is by no means settled that *N. castaneum* and *N. gibberifrons* are not one and the same bird. The young males and females are absolutely indistinguishable, but the adult male *N. gibberifrons* has been found to attain a further plumage which, hitherto, no *N. castaneum* has been known to

acquire. *N. albogularis* differs from both these birds in having the sides of the head darker and more uniform in colour and the darker streaks in the feathers obsolete; but the main difference lies in the Andaman Teal having the white ring round the eye, and the first secondary broadly edged with white.

There is a good plate of *Nettion albogularis* in the British Museum catalogue, and on the same plate is shown the head of *N. gibberifrons*, thus giving a comparison between the two birds.

Nidification.—For a long time the only note on the nidification on the Andaman Teal was the one in 'Nests and Eggs' quoted in all other works. It is:—

"Very little is yet known of the breeding of this species. I have only one note of its nidification, and one egg, both of which I owe to Captain Wimberley.

"The nest was found in August; it was composed of grass, and was placed in a paddy-field near Port Mouat, the only locality with which we are yet acquainted in the group where this species is always to be met with.

"The egg is typical, a very perfect broad oval in shape, with a very close-grained, smooth shell, devoid of gloss, and of a uniform delicate cream-colour.

"It measures 1'93 × 1'43 inches."

From what we know now of this bird's breeding habits it seems possible that this was a whistling teal's nest.

The following further note from Mr. Osmaston, whilst it curiously coincides as far as the eggs go with Hume, is absolutely contradictory to the latter as regards the description of the nest. Mr. Osmaston writes:—

"The Oceanic Teal arrive in Port Blair in large numbers towards the end of May, where they remain until October or November.

"In the winter months they frequent outlying fresh-water jhils such as are found near Craggy Island, North Reef Island, Niell, the Brothers Templegany, and other places. They breed, as far as my experience goes, invariably in holes in lofty and often dead trees, and the eggs are therefore very difficult to procure.

"A man brought me down ten eggs from near the top of a Padouk-tree on August 4th. They were nearly fresh.

"They are rather long elliptical ovals, cream-coloured, and much discoloured. They vary in length from 1'86 to 2'02 inches and in breadth from 1'40 to 1'47, the average of nine eggs being 1'93 by 1'43 inches."

It may, of course, eventually turn out that the Andaman Teal, like the whistling teal, make their nests sometimes on the ground and sometimes on trees.

Some eggs in my collection, also taken by Mr. Osmaston from a nest in a very high dead tree, are similar to those described above, but they are a very pure creamy-white and have a distinct gloss.

General Habits.—There is very little on record about this teal, and it is to be hoped that observers will soon add to our knowledge of it.

By far the most important note on its habits is that contributed by Mr. A. L. Butler to the B.N.H.S. Journal. So interesting is this note that I feel that there is no apology needed, except to Mr. Butler, for again producing it here, nor would any account of the Andaman Teal be up-to-date were it omitted :—

“ When I arrived at Port Blair in May, these teal were in good-sized flocks, resorting principally, at low tide, to two little rocky islets up the harbour, known as Bird Island and Oyster Island. I did not go after them at that time myself, not having a boat: but a fair, though not large, number were killed by some of the officers stationed here. I believe eleven was the result of four barrels on one occasion! As the monsoon commenced, and the harbour became rougher at the beginning of June, these flocks of teal broke up into smaller parties of five or six to a dozen or so, and retired to the creeks and dyke-intersected marshes, a little inland, near Bamboo Flat and Port Mouat. Towards the end of June these small parties began to break up into pairs; about this time I shot several, and in the paired birds I found the testes of the males enlarged, but the ovaries of the females were as yet in ordinary condition. In the ‘Game-birds of India’ Mr. Hume mentions a single nest found in August, and I should think that August or the end of July would be the usual time of laying. I am afraid I am not likely to find a nest, as there are so many hundreds of acres of suitable breeding-ground, and the birds are comparatively few.

“ The Oceanic Teal feed a good deal in the paddy-fields at night; under cover of darkness, too, a few birds often drop into small tanks at Aberdeen within a few yards of bungalows and buildings. When in flocks they are very wild, but in pairs, in the small channels among the marshes, I found them very tame. I have often been able to creep up to the water’s edge and watch a pair swimming quietly about within ten yards of me for some time. On one occasion I came right on to a pair under an overhanging bush, and they only fluttered, like water-hens, along the surface for twenty

yards or so, then pitched and commenced swimming away, so that I was able to kill one on the water, and the other as it rose, from where I stood. Of course, birds that have been shot at a bit go clean away at the first alarm. On these creeks they associate with the common whistling teal, and I have watched the two species in close company on the water, though the Oceanic Teal separate from the others when put up. The only thing I noticed about them, which I do not think has been recorded, is that they have a 'quacking' note as well as a low whistle. One day a party of eight or ten, at which some shots had been fired, after wheeling round and round for some time, pitched on a narrow channel, within thirty yards of me, as I stood concealed in the bushes on the bank. I watched them for some minutes, when another pair, frightened by some distant shots, came scurrying over; the birds on the water all twisted their heads up, and set up a loud quacking call-note, which they kept up for some minutes. The newcomers circled round several times, but probably seeing the top of my *topee*, concluded not to join their companions in their fancied security. The flight of this teal is fairly fast. Occasionally, when they have been kept on the wing for some time, a party will stoop down to the surface of a creek as if they meant to pitch, and then change their mind and rise again. When exercising this manœuvre, they fly past at a tremendous pace. The white wing-bar, in this species, is most conspicuous when the bird is on the wing.

"Winged birds promptly swim for the nearest cover, into which they scuttle off at a great pace, and are generally lost without a dog. One I shot swam steadily along in front of a Pathan convict, who was swimming after it in the capacity of a retriever, and, though hard pressed, made no attempt to dive until it reached the bank, where it was caught. One of the officers stationed here has a live bird in captivity, which was pinioned by a shot some months ago. It thrives well on paddy, but has not become very tame. It spends most of the day asleep, with its head resting in the plumage of the back. The local sportsmen have christened them Gibberies.

"They are rather difficult birds to skin, being very fat, and having, for a duck, rather a tender skin. They seem to average about 15 ozs. in weight."

To this note Mr. Butler adds the following information, which he has kindly sent me in a letter:—

"On December the 2nd I was snipe-shooting at a village called 'Onikhet.' Walking down a *band* which was overgrown with rank grass, I almost put my foot on an Oceanic Teal, which fluttered away in front of me, trailing its wings and feigning lameness. Of course, I thought I had got a nest at last, but a rippling movement in the grass .

in different directions showed me that it was a brood of young ones that I had come across. I instituted a most careful search, but only came upon one youngster, which I caught. All this time the duck was flying round and round within twenty yards, uttering a loud double quack. The drake also appeared on the scene, but kept further off and was silent."

Davison, writing of the Andaman Teal, says :—

" It appears to frequent alike both fresh and salt water. During the day it either perches among mangroves or settles down on some shady spot on the banks of a stream ; when wounded it does not attempt at first to dive, but when hard pressed it dives, but does not remain long under water, and appears soon to get exhausted. It feeds by night in the fresh-water ponds, and I was informed that it is to be seen in some small flocks in the paddy-fields about Aberdeen in the mornings and evenings. Sometimes, in going up the creeks, a pair will slip off the banks into the water, and keep swimming about twenty yards ahead of the boat, only rising when hard pressed, but they are more wary when in flocks. I could learn nothing about the breeding of this species. The only note I have heard them utter is a low whistle, and this apparently only at night when they are feeding."

Genus DAFILA.

The general appearance of the genus *Dafila* is more elongated than any other of our Indian ducks; in both sexes the tail is pointed, and that of the male has the central rectrices considerably lengthened when in good plumage. The bill is slightly wider at the end than at the base.

Of the five species of *Dafila*, India has but one, the very widespread species *D. acuta*. The genus is almost cosmopolitan, Australia alone being unrepresented by any form.

(34) DAFILA ACUTA.

THE PINTAIL.

Anas acuta, *Linn. S. N. x. ed. i*, p. 126 (1758) (Sweden); *Legge, B. of C.* p. 1096.

Dafila acuta, *Jerdon, B. of I.* iii, p. 803; *Hume, S. F. i*, p. 261; *Adam, ibid. ii*, p. 338; *Hume, ibid. iii*, p. 193; *Butler, ibid. iv*, p. 29; *Hume & Davis, ibid. vi*, p. 489; *Ball, ibid. vii*, p. 232; *Cripps, ibid. vii*, p. 312; *Hume, ibid. vii*, p. 493; *id. ibid. viii*, p. 115; *id. Cat. no. 962*; *Scully, S. F. viii*, p. 362; *Hume & Marsh. Game-B.* iii, p. 189; *Vidal, S. F. ix*, p. 92; *Butler, ibid. p. 438*; *Reid, ibid. x*, p. 82; *Oates, ibid. p. 245*; *id. B. of B. B. ii*, p. 279; *Barnes, B. of Bom.* p. 407; *Hume, S. F. xi*, p. 345; *Salvadori, Cat. B. M. xxvii*, p. 270; *Blanford, Avifauna B. I. iv*, p. 447; *Oates, Game-B. ii*, p. 223; *Stuart Baker, J. B. N. H. S.*, xii, p. 437 (1899); *id. Indian Ducks*, p. 181 (1908); *Wait, Spolia Zeylonica*, x, pt. 39, p. 340 (1917); *Logan-Hume, J. B. N. H. S.* xix, p. 750 (1909); *Magrath, ibid. xxi*, p. 658 (1912).

Description. **Adult Male.**—Whole head brown, varying from a rather pale dingy to a rich dark umber, glossy on the upper parts, with purple or copper sheen more especially on the sides of the sinciput and nape; chin and throat sometimes rather paler than the upper parts; nape almost black,



THE PINTAIL.
Dafila acuta.
 $\frac{1}{3}$ nat. size.
male
female

grading on the one hand into the rich brown of the head and on the other into the grey of the hind-neck; the grey formed by the most minute stipplings of brown and pale grey, gradually changing into more pronounced stipplings and bars on the upper plumage, which retains the same colour; a white band on either side of the nape joining the white of the neck. Rump like the back; upper tail coverts black, edged grey; neck and breast white; abdomen the same, but more or less stippled with grey on the lower parts; flanks and sides like back. Longer scapulars velvety-black edged with silver-grey; shorter scapulars like the back, but often with dark centres; wing-coverts brownish-grey, the greater tipped with rufous-chestnut; secondaries forming the speculum bronze-green, tipped white, sub-tipped black, the feather next the speculum black, on the outer web narrowly tipped white and with a line of the same next the quill, inner web brownish-grey; remaining inner secondaries grey on the outer webs, black edged with grey on the inner webs. The central rectrices black, the other rectrices grey-brown; lower tail-coverts black, except the exterior ones, which are white; the flanks next the tail-coverts are white, more or less tinged buff, and with vermiculations fainter than those on the rest of the flanks.

Measurements.—Length about 26 inches, depending on length of tail-feathers, which vary from 4·5 inches to full length, central rectrices 9 inches long, wing 10·5 to 11·5, tarsus 1·5 to 1·75, bill from gape and from front about 2·25.

“Length of male 22 to 29 inches, tail 5 to 8·5, wing 11, tarsus 1·6, bill from gape 2·25.” (Blanford.)

“Expanse 32·0 to 37·75 inches, wing 10·3 to 11·75, tail from vent 4·8 to 9·4, tarsus 1·5 to 1·8, bill from gape 2·0 to 2·4. Weight 1 lb. 10 ozs. to 2 lbs. 12 ozs.” (Hume.)

Colours of soft parts.—Irides dark-brown, often tinged red; bill light to dark plumbeous, the culmen, lower mandible, and base darker, almost black. Legs and feet dark plumbeous-grey or blackish; webs, claws and joints darker.

“In the adult male the bill is plumbeous, light-plumbeous, or lavender-blue, with the entire lower mandible, a broad band along the entire culmen, the angle at the base of the upper mandible, and a strip along the margin of its terminal half black.

“In some apparently adult males I have noted the feet as brownish-black, blackish-grey, and uniform dusky.” (Hume.)

“Legs blue; irides brown; bill black, blue at sides.” (Vidal.)

“Legs very pale yellowish flesh-colour, variegated with shades of purplish-brown, darker tint of last on the nail and web-membranes.” (Swinhoe.)

Post-nuptial plumage.—“The drake moults all feathers except the primaries, secondaries, wing-coverts, and six pairs of outer rectrices at the end of June, and assumes plumage very like that of the female, the usual male plumage being resumed by a complete moult in October.” (Blanford.)

Female.—Head brownish-buff, with dark centres to the feathers; throat and chin pale; neck the same, speckled brown; upper parts brown, the feathers edged white or buffy-white, and scapulars with a few bars of the same; the white tips of the greater secondaries and greater coverts form two distinct bars, but there is no speculum; quills dark-brown, the inner ones narrowly edged white and all paler on the inner webs; lower parts dingy white, more or less tinged buff, or even rufous, and streaked and centred brown.

Colours of soft parts.—Irides brown; bill and legs like the male, but duller, and, as far as I know, the bill never has a blue tinge. I have one female with a distinctly orange tinge to her legs, showing as a sort of mottling on the shanks.

Measurements.—Length about 20 inches, wing 9·75 to 10·25, tarsus about 1·5, tail about 4 to 5·25, bill at front 2·0 to 2·1, from gape about the same.

“Length 20 to 22·5 inches, wing 9·8 to 10·2, tail from vent 4·2 to 5·5, tarsus 1·45 to 1·7, bill from gape 2·1 to 2·35. Weight 1 lb. 2 ozs. to 1 lb. 14 ozs.” (*Hume.*)

Young Male.—Has the wing like that of the adult male, but is otherwise coloured like the female. The first male plumage to be assumed is that of the back, which may often be seen in the transition-stage between the mottled colouration of the female and the fine stippling of the male; the lower plumage is the next to change, though the broad mottled plumage of the lower flanks is often retained for some time; and, finally, the dark head and white neck of the adult male are assumed. Young females are very thickly speckled and mottled on the lower surface.

Young birds of both sexes appear to have legs and bills a uniform dusky.

“Young in Down have the same pale spots on the upper parts as those of the Mallard, but the white on the throat and belly is slightly suffused with grey instead of buff, and in addition to the dark line passing through the eye, a second line passes from the lores below the eye to the nape.” (*Seeboldm.*)

Distribution.—*Salvadori* gives the habitat thus:—

“Northern Hemisphere, breeding in the northern parts, and migrating southwards to Northern Africa, India, Ceylon, China, and Japan, and in America as far as Panama and Cuba.”

There is practically no portion of the Indian Empire which the Pintail does not visit; *Hume* excluded it from South Tenasserim, but it has now been recorded thence more than once, though it appears to be very rare there. *Davidson* reported it as rare in the

Deccan (some writers have found it less rare than he did); and Vidal says:—

“ Pin-Tails are to be seen in some years in small parties in the large duck ground at the junction of the Vashishti and Fagbudi Rivers (South Konkan), but they come late and go early.”

Nidification.—The breeding range of the Pintail is practically that of the gadwall, but it reaches further north, and, on the other hand, does not reach so far south; for whereas the gadwall breeds as far south as the 46°, Hume places the limit for the Pintail 10° further north. It breeds in Northern Europe, and eggs and young have been found in the north of the British Isles themselves, and it extends thence throughout Northern Asia.

The nest is a rather loose structure of grasses, flags, rushes, and similar material, lined, not very thickly as a rule, with down and feathers; and the eggs are generally laid in early May, though the date depends a great deal on the locality; in the bird’s southern limits the eggs may be laid as early as the end of April, and in its northern haunts from April to August. The earliest eggs taken by Seeböhm in Siberia were on the 5th of June. He also describes the nests as being placed “in the grass among the shrubs in dry places, generally at some distance from the water; they were deep and well-lined with dead grass and sedge, and, when the full clutch was laid, contained plenty of down.” During the breeding season, i.e., April to August, the Pintail haunts swamps and marshes which are more or less covered with vegetation—the pools, such as there are, of open water, being confined to patches here and there, surrounded with bush, forest, or other cover. Open waters, such as lakes, rivers, or similar pieces of water, it avoids altogether; nor is it any use hunting the banks and margins of such for the nests, which will almost invariably be found in the places first mentioned.

Morris, in ‘Nests and Eggs of British Birds,’ says:—

“ Of this species, also, the nest is placed by the margin of, or at no great distance from water, lakes, ponds and seas, and is composed of grass and reeds with a little lining of down. Some have been found in ditches and even in standing corn; it is always well-concealed.

“ These ducks pair in April.

"From six to eight or nine eggs are laid. The young are hatched in about twenty-three days. They at once repair to the water."

The nest is usually well-concealed amidst the shrub and coarse reeds and grass, and takes a considerable amount of searching to discover; but the duck sits very close, and often rises at one's feet almost, thus disclosing the position, which might otherwise escape detection.

The eggs vary from six to ten in number, being usually six to eight, and occasionally only five are laid.

In colour they are a pale dull greenish stone-colour, in a few yellowish-stone, but all are dull and all pale with no very definite colour such as some ducks' eggs have. There is a slight gloss, sometimes rather pronounced, and I have seen none entirely glossless. The texture is extremely fine and close, and the shell perhaps rather thinner in proportion to the size of the eggs than in the majority of eggs of the *Anatinæ*.

My eggs seem to average rather large; I have a clutch given me by Herr M. Kuschel, and collected in East Prussia, which averages $2\cdot24 \times 1\cdot6$ inches; the biggest is $2\cdot27 \times 1\cdot62$. A number of other eggs I have measured have been well over $2\cdot20$, and I have seen none under $2\cdot1$, but Hartert gives the minimum as $2\cdot00$ inches.

The eggs collected in Finland, both by Wolley and Dresser, had their measurements recorded as $2 \times 1\cdot5$ inches, but the eggs collected by the latter in Jutland measured $2\cdot22 \times 1\cdot4$.

The average of 100 eggs collected by Gobel is given as $55\cdot0 \times 38\cdot8$ mm. ($= 2\cdot16 \times 1\cdot53$ inches).

It is possible that this bird may breed in Kashmir, Ladak and Tibet for I have received a male from Rhamtso said to have been shot whilst swimming "in attendance on wife on nest." The eggs are typical Pintail's eggs, and I have no reason to disbelieve their being authentic. The nest was not described, but was presumably in a reed-bed in the lake itself as the bird was reported to be swimming round the nest. Logan-Hume reports also seeing a drake Pintail on the 2nd July in full breeding-plumage in Baltistan on the Drosai plateau. The bird was flying up a stream to a small marsh close by, and evidently breeding.

General Habits.—Taken all round, the Pintail is one of the most

common of Indian ducks, occurring sometimes in huge flocks, but more often in such as number forty to sixty individuals. It is but rarely that very small flocks are seen, and solitary birds or pairs hardly ever. Where they are least common, flocks of only twenty or so may be met with frequently, but this is about the minimum number. As regards the maximum number, it is hard to give figures, but Hume speaks of thousands in a flock, other writers of many hundreds in a flock. I have, myself, both in Bengal and Assam, seen flocks which must have contained from 300 to 500 birds, although such are not of common occurrence. G. Reid, in his 'Birds of the Lucknow Civil Division' ('Stray Feathers'), speaks of them being "generally met with in immense numbers," but he does not define what he means by "immense."

In India the Pintail seldom arrives before the middle or even end of October, and in Eastern India we did not expect them in any numbers until the end of November. Magrath records shooting them on one occasion as early as the 21st September in Kashmir.

Most sportsmen would place the Pintail before all other ducks. As a rule they are extremely shy, wary birds, and are very hard to approach within gunshot, though one or two people have found them to be quite the contrary! Capt. Baldwin says that he found them easy to approach even when feeding on open pieces of water. This is somewhat confirmed by the fact that in Cachar the natives tell me that they can get at Pintails far more easily than at other ducks, and it is true they *do* bring in more Pintails in proportion than they do gadwalls, teal, &c. ; at the same time I have personally found them to be the hardest to get at of all the ducks ; and such of my friends as have given me their experiences have found the same.

In the daytime they frequent large lakes and jheels and rest in the centre of wide, comparatively open pieces of water, shunning such as have thick cover of reeds or similar heavy jungle, and resorting always to those which have the surface covered with lilies and the smaller water-plants, amongst which they can lie well-concealed, yet able to discern at once the approach of anything to their vicinity. During the night—they do not leave their quarters until very late—they visit the smaller jheels and tanks, the rushy banks of the nullahs and canals, and similar places, where they feed, but the

first glimmer of dawn finds them on the wing once more *en route* to the larger waters. Big rivers they do not seem to like; all down the Surma Valley the Pintail is very common, but though found in numbers on the vast expanses of water quite close to the Barak, Surma, Megna, &c., and often seen evening and morning crossing the river high up out of range, yet I have never heard of its haunting any of these rivers.

In the same way I believe it is practically non-existent on the Ganges, Indus and other large rivers. Small rivers, if of clear and quick-running waters, are no more pleasing to the Pintail; but small creeks of almost still water and canals, which have vegetation about them, are visited for the purpose of getting food, and occasionally a flock may be put up from such places in the daytime.

Wait says that in Ceylon it seems to be confined to coastal lagoons which during the winter are flooded with rainwater and become brackish, and in some places almost fresh.

The food seems mainly to consist of small and fragile shell-fish, but the birds also eat a large variety of other animal matter, and also are to a certain extent vegetarians. Unlike, however, the majority of the ducks which are more animal than vegetable feeders, the Pintail is amongst the very best of birds for the table. Sometimes, it is said it becomes rank, fishy and almost uneatable, but as a rule it is excellent and *nearly* always good.

Many others must have noted a peculiar habit of the Pintail to which Hume alludes:—

“ It is worth noting, because it is a peculiarity almost confined to this species, that during the cold season one continually comes across large flocks consisting entirely of males. I cannot say that I have ever noticed similar flocks of females; but this may be because the females do not attract the eye similarly, and are not equally readily discriminated at a distance; but ‘bull picnics’ I have *noted* times without number, as a speciality of the Pin-tail.”

Pintail are decidedly good swimmers, sitting light and very high on the water, their long necks and rather raised tails giving them a very graceful appearance: as divers, however, they are failures; they cannot stay any time under water, nor can I find any observer giving them credit for being able to hide under water amongst the weeds, or of holding on to submerged weeds, etc., with their feet.

Getting off the water they are less quick than some ducks, "skittering" along the surface for a few feet; they rise less abruptly also, but once on the wing they show to the greatest advantage; their flight is exceedingly swift, probably faster than that of any other duck, and is very easily recognizable. They fly in very regular formation, changing position less than do most ducks, and when close to the hearer the sound of their flight is quite unmistakeable. Less noisy and whirring than that of most of their near relations, their flight has a soft swish-swish about it of a very distinctive character. Hume says, speaking of their flight, that it is a low "soft hissing swish," and this describes it exactly. Their voice is like that of the mallard, a distinct quack, but it is far softer and also less loud than that of the mallard, gadwall, or spot-bill; they are, however, silent birds, and one seldom hears them emit any other sound beyond the low colloquial chuckle they sometimes indulge in when resting. I have not heard them calling when on the wing, except when about to settle, or just after rising, or when suddenly frightened. Seebohm says that the voice closely resembles that of the mallard, and adds "its call-note is a low *kak*"; and Naumann says that in the pairing season the male may be seen swimming round the female, uttering a deep click which, if the observer be fortunately near enough to hear it, is preceded by a sound like the drawing in of the breath, and followed by a low grating note.

On the land they walk easily but slowly, as might be expected from their configuration, nor will they often be found resorting to it, though Hume records having seen them on the land.

In the autumn the male bird assumes a plumage similar to that of the female, but can, of course, always be distinguished at a glance by the presence of the speculum, which is wanting in the female. Hume says that he has never obtained any birds in this stage of plumage in India, but in my own very small series I have two, and I have seen several others. Yarrell, speaking of this change of plumage, says that it commences in July, and is effected partly by change of plumage, and partly by actual change of colouration in the feathers. As regards the reassumption of the male plumage he says:—

"At the annual autumn moult the males again assume with their new plumage the colours peculiar to their sex, but the assumption is gradual. White spots first appear among the brown feathers on the front of the neck; by the end of the second week in October the front of the neck and breast is mottled with brown and white; at the end of the third week in October a few brown spots only remain on the white."

Both my birds were obtained in the third week of October and are in the plumage ascribed by Yarrell to that of the second week; the heads are entirely like those of the female.



female.

THE GARGANEY or BLUE-WING TEAL.

Querquedula querquedula.

$\frac{1}{3}$ nat. size.

male.

Genus QUERQUEDULA.

The distinctive feature of the genus *Querquedula* is the bright blue-grey colour of the wing-coverts, which, in two species, *discors* and *cyanoptera*, are a bright smallt-blue. The common teal (*Nettion crecca*) used to be placed in this genus; but *Nettion* differs from *Querquedula* in the shape of the bill, which is equal in breadth throughout its length, whereas in the latter it is slightly broader at the tip, and also has the nail somewhat larger in proportion.

The internal structure is also different, the labyrinth of the trachea being differently formed, being enlarged on both sides downwards in *Querquedula*, but on one side only and upwards in *Nettion*.

There are five species, of which four are confined to America, the fifth alone visiting India in winter. All five are birds of much the same size.

(35) QUERQUEDULA QUERQUEDULA.

THE GARGANEY, OR BLUE-WING TEAL.

Anas querquedula, Linn. S. N. x. ed. i, p. 126 (1758) (Sweden); Hartert, Vog. Pal. p. 1318 (1920).

Anas circia, Legge, B. of C. p. 1080.

Querquedula circia, Jerdon, B. of I. iii, p. 807; Hume, Nests and Eggs, p. 644; Hume, S. F. i, p. 262; Adam, *ibid.* p. 402; Hume, *ibid.* iii, p. 193; Le Mes. *ibid.* p. 382; Butler, *ibid.* iv, p. 30; Scully, *ibid.* p. 201; Butler, *ibid.* v, p. 234; Hume & Davis, *ibid.* vi, p. 489; Butler, *ibid.* vii, p. 188; Ball, *ibid.* p. 232; Cripps, *ibid.* p. 312; Hume, *ibid.* p. 494; *id. Cat.* No. 965; *id. S. F.* viii, p. 115; Scully, *ibid.* p. 363; Hume & Marsh. Game-B. iii, p. 215; Vidal, S. F. ix, p. 93; Butler, *ibid.* p. 438; Reid, *ibid.* x, p. 83; Hume, *ibid.* p. 418; Oates, B. of B. B. ii, p. 286; Barnes, B. of Bom. p. 410; Hume, S. F. xi, p. 346; *id. Nests and Eggs* (Oates' ed.), iii, p. 291; Salvadori, Cat. B. M. xxvii, p. 293; Blanford, Avifauna B. I. iv, p. 449; Oates, Game-B. ii, p. 119; Stuart Baker, J. B. N. H. S. xii. p. 445 (1899); *id. Indian Ducks*, p. 188 (1908).

Description. Adult Male.—Crown and nape deep-brown, lighter on the forehead, where it is more or less streaked with white, and sometimes with a faint gloss at the sides. A broad superciliary stripe from in front of the eye, down the sides of the nape, white; chin black; remainder of the head and neck rich bright chocolate, streaked with white; back, rump, upper tail-coverts and tail brown, the feathers all edged paler or greyish-brown; inner scapulars black, glossed green, with broad wide central streaks and narrow white margins; outer scapulars the same, but with the outer webs broadly blue-grey; wing-coverts bright pale French grey, the greater ones broadly edged white, forming a wing-bar; outer secondaries brown-grey, glossed green and tipped white; quills brown; the inner primaries greyish, broadly edged greyish-white; breast brown, with black or dark brown markings, concentric on the upper breast, in the form of bars on the lower breast, gradually changing one into the other; abdomen white, more or less speckled with brown towards the vent; thigh-coverts brown and white; flanks white, finely barred with black, the feathers nearest the tail with two broad bars of white and grey divided by a narrower black line; under tail-coverts white or buffy-white, the shorter with brown drops; under wing-coverts mainly dark grey, the central ones and axillaries white.

Colours of soft parts.—Irides dark-brown; bill brownish-black, nail black, margins of maxilla and lower mandible paler; legs and feet dark-grey.

I have a bird which had the feet bright orange; this must be something very unusual.

"In the adult male the bill is normally blackish above, brownish on the lower mandible, except at the tip, often reddish-brown at the gape.

"The legs and feet are grey, pale greenish-brown, grey with an olive shade, grey slate-colour, purplish slate-colour, bluish . . . in all cases the webs being more or less dusky, and the claws darker still." (Hume.)

Measurements.—Length 15 to 17 inches, tail about 2·8, wing 7·6 to 8·0, tarsus 1 to 1·2, bill from gape 1·8.

"Length 15·9 to 16·25 inches, expanse 25 to 27·25, wing 7·4 to 8·1, tail from vent 3·3 to 3·8, tarsus 1 to 1·3, bill from gape 1·75 to 1·92. Weight 10 ozs. to 1 lb. (commonly about 13 ozs.)." (Hume.)

Width of bill at gape 0·52, at tip 0·62 inches.

Female.—Above dark-brown, all the feathers with pale margins, except the crown, which is rather richer than elsewhere and centred darker; chin and throat white; neck greyish or buffy-white, with all the feathers minutely streaked with dark-brown; a superciliary stripe from above the eye and a spot on the front of the lores white or buffy-white; wings greyish-brown, in old females more grey, especially on the smaller coverts; speculum as in the male, but very blurred and indistinct; fore-neck and upper breast dark brown, with broad pale edges to the feathers; lower breast, abdomen, and vent white, buffy-white or buff; the flanks, sides, and under tail-coverts the same, blotched, barred, and spotted with brown.

The colours of the soft parts the same as in the male.

"In some females the bill is similar" (to the males); "in some, apparently adult, it is a blackish-plumbeous above, dull plumbeous below." (Hume.)

Measurements.—Length about 15 inches, wing about 7·25, tail 2·6, bill from gape 1·7, tarsus 1, bill at base 0·51 broad, at tip 0·60.

"Length 14·8 to 15·5 inches, expanse 23·0 to 25·5, wing 7 to 7·3, tail from vent 2·9 to 3·5, tarsus 1·0 to 1·15, bill from gape 1·7 to 1·85. Weight 9 to 14·75 ozs. (commonly about 12 ozs.)" (Hume.)

I have a female in my collection which weighed 1 lb. 1 oz., and has a wing of 7·65 inches.

The young males are similar to the female, but are darker, have more brown on the under parts, the speculum is more defined, and the coverts a purer grey.

Males in post-nuptial plumage resemble the females, but have the wing, except the scapulars and innermost secondaries, of the usual colour.

"The Downy Nestling resembles that of the Mallard, but is smaller, and has a broad unbroken buff streak above the eye and a well-defined dark streak through the eye." (Yarrell.)

Distribution.—The general habitat of the Garganey may be said to be the Palaearctic region, but it is an eastern, not western form; it has been obtained in North America and Greenland, but its home is Northern Europe and Asia in the summer, and Southern Europe, Northern Africa (as far south as Shoa, Somaliland), and Southern Asia in the cold weather.

Outside India in the winter it is to be found throughout Southern Europe and Northern Africa, is very common in Egypt, and ranges through Asia Minor and Arabia, Persia, Afghanistan, Southern China, Japan, the Philippines, Borneo, Java, etc.

In Japan, Seeböhm says:—

"The Garganey is a winter visitant to all the Japanese Islands, but appears to be nowhere common."

Hose and Everett both obtained specimens in the Bornean Islands, but it would appear to be a rare straggler there.

In India it occurs practically everywhere, from the extreme north to the extreme south. As regards its distribution in Ceylon, Legge says:—

"Found in the extreme north about the Jaffna Peninsula, on the swamps of the Island of Delft, and on the west coast down to

Manaar during the cool season from November to March. Layard speaks of its occurring in 'vast flocks' at the head of the Jaffna estuary; but I do not think it is so common nowadays."

It extends throughout Burma, but is alleged to be absent in certain portions. Hume says that it is not found in Tenasserim, but it has now been frequently recorded thence. It is common in parts between the Sittang and Salween, and extends west of the former river. Oates records that it is found throughout the Shan States, at least as far as Kentung, where Lieutenant J. H. Whitehead has shot it. It occurs in Kashmir, and has been recorded from that State on various occasions.

Nidification.—As regards the breeding of the Garganey within Indian limits, there is practically no evidence of any value.

Colonel Irby told Hume that when in Oudh he caught some young *half-fledged* in the month of September. This shows, of course, that once upon a time a pair of these teal did remain in India and bred, but it does not at all show that they ever stay *of their own accord* to breed. This unfortunate pair had very likely been slightly damaged by shot or accident, and so were unable to take the exertion of migration; and this, doubtless, is the reason for the many birds staying in India, and being seen in various months, when they should have been far away, and breeding in other climates and countries. They have been seen in practically every month in the year, and such records are many; but, as I have said of other birds elsewhere, every year millions are killed, and it would be strange indeed if a few did not get injuries from which they recovered, yet not sufficiently soon to allow of their migrating.

Colonel Tickell wrote from Moulmein mentioning a young bird just fledged which had been caught on a small pond in the vicinity. This may have been a young bird, backward and rather weak, and consequently so exhausted with its long journey as to be caught and produced as a specimen locally bred, or it may have been one bred under the circumstances already suggested.

Blyth wrote, in reference to this statement of Tickell's: "The Garganey breeds sparingly, no doubt, in India, as well as in Burma and Tenasserim"; but from what this deduction was made I cannot tell, nor can I find any perfectly authentic records of the Garganey

breeding in India, beyond the circumstantial evidence given by Colonel Irby's young birds.

Garganey breed throughout the north temperate zone in Europe and Asia. In the former continent they breed as far south as France, North Italy, Greece, and throughout the Balkan States and Russia into Asia; in parts of Asia Minor, South Siberia, Manchuria, Amoorland, and Northern China, but not in Japan, as far as is yet known.

They desert the larger open pieces of water during the breeding-season, and resort to smaller pools and ponds, fens and bogs, rarely the mossy and weed-covered borders of streams, and yet more rarely the reed-fringed shores of lakes, &c.

Although so commonly found on the sea-coast and on salt water creeks and on tidal waters, yet Garganey seem always to breed inland, and I can find no record of their nests and eggs being taken in the above places.

The nest is the usual mass of weeds, reeds, and soft vegetation collected by most ducks; and it is said that occasionally it is made of sticks and twigs, but this, I imagine, is very exceptional.

The lining of down and feathers varies much; in some it is very dense and copious, in others very scanty; normally it is neither the one nor the other—rather scanty, however, than otherwise.

The nest is most often placed in some thick tuft of coarse grass, bed of reeds, or tangle of shrubs and grass in fen-land, or on the borders of some vegetation-covered piece of water. The eggs vary in number from six to thirteen, the number most often found being from eight to ten.

Morris gives the number laid as eight to ten or even fourteen. According to him, incubation lasts twenty-one days, and the young birds follow their mother to the water as soon as hatched.

The eggs, at least all I have seen, were quite indistinguishable from those of the common teal in shape, texture, and size, and, I think, in colour. Hume says that they have perhaps a more yellow creamy tinge, but though a few may be more buff or yellow in tone than any of that bird, many are no deeper at all.

Dresser gives the average as $1\cdot87 \times 1\cdot35$ inches; those in my collection average $1\cdot82 \times 1\cdot36$, making them out to be rather shorter and rather broader.

Hartert gives the following measurements for 119 eggs:—

Average	<u>44'96</u>	\times	<u>32'48</u>	mm. (1'77 \times 1'28 inches).
Maxima	<u>48</u>	\times	<u>35</u>	,, (1'9 \times 1'38 mm.).
Minima	<u>39'3</u>	\times	<u>29'7</u>	,, (1'54 \times 1'17 mm.).

General Habits.—It would seem that in the extreme north and north-west the Garganey is perhaps the earliest of the ducks to arrive in India, but further east it is quite a toss-up as to whether the common teal or the Garganey first puts in an appearance. On the whole, I should think the common teal is the earlier of the two.

Even in the west the Garganey is not always the first, the common teal being sometimes the first recorded.

It is very noticeable that, though in migrating south the birds once in India take long to work further down the Peninsula, yet they work north very speedily.

In Northern India they arrive in September, and have even been seen as early as August, but, according to Theobald and others, they do not get to Southern India before December. Leaving, however, they delay until March and April, much the same time that they leave all portions of their winter home, though everywhere a few stay through May, and even into June.

As regards the numbers they arrive in, Hume's notes on one of his enormous bags shows what may be sometimes seen. He writes:—

“ I have a special note of having found a flock, which I estimated to contain 20,000 individuals, at Rahun in the Etawah district, on the 28th August, 1865. Never before, or since, have I seen so huge a body of fowl of one kind, and I have noted that I bagged forty-seven of them, besides losing at the time many wounded birds (I had no dogs with me) in the rushes. I had sent my gun-punt (built exactly on the lines of one of our Norfolk boats) a few days previously out there to see that it was alright for the coming season, and I had taken with me a small but heavy Monghyr-made swivel-gun, carring only 8 ozs., to try. To my surprise I found the thickest body of fowl—on the open part of the jhil—I had ever seen. I loaded the swivel with No. 4 shot and worked up quite close to some of them, and within some fifty yards of the main body, when seeing they were all about to start, I fired and knocked over at least sixty; I actually secured forty-seven.”

This was thirty-five years ago, and I fear that flocks like this one are things of the past, though Garganey may now and then be met

with in very vast flocks. All through the Sundarbands, and again on the Chilka Lake, they are often to be seen in flocks of thousands, and in Oudh, the north-west, and Sind, such flocks are by no means rare.

As a rule, over most of the bird's north and north-western range, the flocks may roughly be said to average somewhere about and between one to two hundred. To the east, I think, they average smaller, and would put it somewhere between fifty and a hundred. Small flocks of five or six, or even ten or twelve, are not, I think at all commonly met with, while pairs and single individuals are hardly ever seen.

Garganey haunt almost any kind of water, not, *as a rule*, frequenting small, quick-running streams, or small clean tanks and ponds, and being specially partial to wide stretches of fen or bheel, well covered over their greater extent with weeds, yet having fairly extensive patches of clear water dotted here and there over their surface.

During the day they keep almost entirely to the larger sheets of water or, sometimes, to the large rivers, such as the Indus, Ganges, etc., where they float in the centre in dense, closely-packed masses. This manner of packing is very characteristic of the Garganey, and they keep more closely together than does any other kind of duck; even when flying they do not straggle much. They feed in the smaller tanks and jhils, and also in the paddy-fields, and on various young land-crops. Hume says that in some parts of India they visit the paddy-fields in such numbers that on one visit *acres* of paddy are destroyed. Their staple diet is vegetarian, and of vegetable matter the staple articles are rice, both cultivated and wild, and the young leaves and shoots of various water-plants. They also eat various kinds of seeds, roots, etc., and such animal matter in the shape of worms, snails, and shell-fish, etc., as forces itself on their notice.

Hume describes well the sound of their flight thus:—

“ Whether it is only because one habitually meets them in such large flocks, or whether it is really peculiar to them, I do not know; but certainly one associates the overhead flight of this species with the surging hiss, more even, sustained, and rushing than that of any of our other ducks. Anyone who has stood under heavy round-shot fire knows the way in which shot hurtle up to you crescendo, and die away as they pass; and just in this way (though the sounds are

in a wholly different key) does the swish of a large flock of Garganey surge up to you in the middle of the night, and die away as they pass."

I do not think that it is because the birds are numerous or familiar that we think the sound distinct from that of other birds' flight. I remember when first introduced to the Garganey how I was struck with the patterning swish of their flight, and then noticed how like a whistle it rose and fell as it approached and receded. Their flight is but little, if at all, inferior to that of the common teal, though more direct, the flocks seldom indulging in the swift dodgings and swervings of that bird. Shooting over the vast Jessor bheels in boats, which went in a thinly-scattered line through them, the difference between the flight of the two species was well shown. The Garganey rose far ahead, swept round but once in a wide semi-circle, and then went straight ahead, whereas the common teal often dodged in and out down the whole line, circled about two, three or more times, and then disappeared, but often only to settle half a mile or so further on. The Garganey also rose quicker off the water, getting up obliquely, and were quicker away; again, when wounded they swam away faster than the common teal, and though by no means first-class divers, yet they were good enough to be able often to escape us by this means.

As to whether they are wild or tame, opinions seem to differ very much. Theobald says:—

“They are not very hard to shoot, and are easily approached behind a small screen of green boughs; sometimes a paper kite, made in the shape of a hawk and flown over the tanks, keeps the teal together, and they will not leave the tanks though fired at often.”

Dresser, speaking of the Garganey in Europe, and quoting Baron Droste, actually says: “They are very tame, and soon get accustomed to the sight of human beings.” Reid says that they are shy and wild when they first arrive (in Lucknow), but afterwards become tamer. Hume says that they are never tame, and generally decidedly wild. As far as my experience goes, I have found that the Garganey is one of the wildest of the duck tribe; even when the would-be shooter keeps behind screens, etc., they seem to be very cute, and to be able to discern what is behind the screen quicker

than many others of their kind, and they are not slow to profit by what they can discern.

Then, too, they keep much to fairly open water when resting, and a sudden appearance of a detached clump of weeds floating towards them at once puts them on the *qui vive*, and long before the clump gets within shooting distance, two out of three times they leave for safer abodes.

I once, however, came on a flock of these little birds which stuck more persistently to their ground, or water, than any other flock of ducks it has been my fortune to meet. This was in the district of Hazaribagh, and I was going from Giridi to Hazaribagh in a *push-push*, a sort of four-wheeled, inferior, springless brougham, when I saw a flock of about forty teal on a tank close by the road. I got out of the *push-push*, walked up to the tank, and got two birds with a right and left as they rose; the birds wheeled round, and I got a third: they went then to another tank 600 yards away, and, as I followed them up, again rose and returned to the first piece of water, leaving a fourth bird with me. I, too, went back and got yet another brace, and after these yet another bird on the second piece of water, and when I left with seven Garganey the rest were already back on the tank by the road. This was, of course, in a badly-watered part of the country, but on no other occasion, whether there was water in abundance or not, have I ever known Garganey remain to have more than a right and left fired at them.

They are very silent birds as a rule. Hume speaks of them chattering, like all other ducks in confinement, on the slightest provocation, but their ordinary note, a loud strident quack, is very seldom used when the birds are in a state of nature. Seeböhm considers their voice to be:—

“ Not quite so loud as a mallard, but is in a slightly higher key; it may be represented by the syllable *knahe*. It is generally uttered singly, but sometimes repeated twice. The quack is common to both sexes, but in the breeding season the male utters a harsh grating note, resembling *kr-r-r*.”

Genus SPATULA.

The genus *Spatula* is distinguished from all other genera, except the Australian *Malacorhynchus*, by the shape of the bill, which is broadly spatulate, being about twice as broad at the subtip as it is at the base. There are four species, whose range is practically cosmopolitan, but only one is represented in India, viz., the Common Shoveller.

The lamellae are very long, thin, and prominent, and the edges of the upper mandible are much turned down on the terminal quarter.

The tail-feathers number fourteen in both sexes.

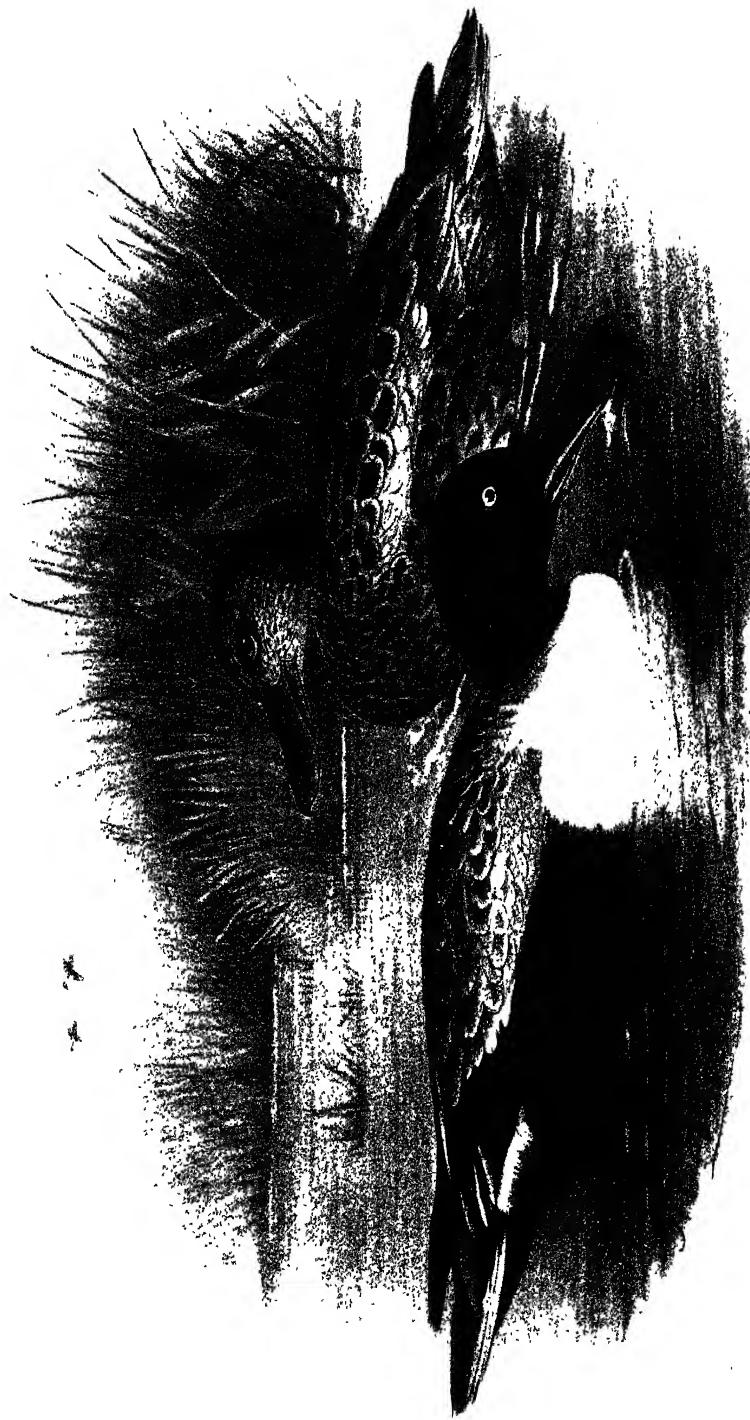
(36) SPATULA CLYPEATA.

THE SHOVELLER.

Anas clypeata, Linn. S. N. x. ed. i, p. 124 (1758) (South Sweden).

Spatula clypeata, Jerdon, B. of I. iii, p. 796; Hume, S. F. i, p. 260; Adam, *ibid.* p. 402; Butler, *ibid.* iv, p. 28; Scully, *ibid.* p. 199; Fairbank, *ibid.* p. 264; Ball, *ibid.* vii, p. 232; Hume, *ibid.* p. 492; *id. Cat. No. 957*; *id. S. F. viii*, p. 115; Scully, *ibid.* p. 362; Legge, B. of C. p. 1086; Hume & Marsh. Game-B. iii, p. 141; Vidal, S. F. ix, p. 92; Butler, *ibid.* p. 437; Reid, *ibid.* x, p. 80; Davidson, *ibid.* p. 325; Hume, *ibid.* p. 417; Macgregor, *ibid.* p. 472; Barnes, B. of Bom. p. 401; Hume, S. F. xi, p. 343; Salvadori, Cat. B. M. xxvii, p. 306; Blanford, Avifauna B. I. iv, p. 452; Oates, Game-B. ii, p. 246; Stuart Baker, J. B. N. H. S. xii, p. 453 (1899); *id. Indian Ducks*, p. 196 (1908).

Description. Adult Male.—Whole head and neck glossy-green, showing a purple tinge in certain lights, especially on the upper parts; upper breast, lower neck, outer scapulars, and outer portion of upper back mauve-white; a narrow centre patch from the neck brown, the feathers edged pale, in fine specimens with broad white edges; back brown, the feathers pale-edged; rump and upper tail-coverts black, glossed with peacock-green and blue,



THE SHOVELLER.
Spatula clypeata.
male.
 $\frac{1}{3}$ nat. size.

THE SHOVELLER.
Spatula clypeata.
female
 $\frac{1}{3}$ nat. size.

the former tint predominating; rectrices brown, edged white, increasingly broader on the outer ones; lower breast, flanks and abdomen rich rufous-chestnut, some of the feathers on the posterior and inferior flanks lighter and vermiculated with brown; thighs the same but duller; sometimes a few black spots on the breast; wing-coverts a beautiful blue-grey, some of those next the inner secondaries glossed Prussian-blue on the terminal quarter of the outer web: greater coverts more brown, forming a wing-bar next the speculum; one of the outer scapulars brilliant grey-blue, others black glossed with green and with white centres; tertaries deep brown-black, glossed with green, turning to blue at the tips; quills dark brown; speculum a brilliant metallic green; under tail-coverts black, glossed with blue-green; flanks next tail-coverts white.

Colours of soft parts.—Bill black; legs orange, claws horny-brown; irides yellow, orange or orange-red.

“In the male in winter the bill is black, usually with a greyish shade; in some it may be called leaden dusky. In November, when they first arrive, and in the case of birds of the year until much later, the bills of the males are like those of the females.

“The irides vary; as a rule, in the male from yellow to reddish orange, but I have recorded them as brown in two or three males.

“The legs and feet vary from orange to Indian or tile-red, and are usually brighter coloured in both sexes in the spring, and at the same season in the male than in the female. The webs are often dusky towards their margin.” (*Hume*.)

Measurements.—“Length about 20 inches, wing 9·3 to 9·8, tail about 3·5, bill from gape about 3, tarsus 1·4.

“Length 19·7 to 21·75 inches, expanse 29·75 to 32·8, wing 9 to 9·8, tail from vent 3·6 to 4, tarsus 1·2 to 1·5, bill from gape 2·95 to 3·05. Weight 1 lb. 3 ozs. to 1 lb. 14 ozs.” (*Hume*.)

Post-nuptial plumage.—After the breeding-season the male assumes the plumage of the female, but may always be distinguished by the speculum on the wing, generally darker, less marked upper parts, and the plain dark upper tail-coverts.

Blanford says: “It is rare in India, so far as my experience goes, to see a male in full plumage before the end of February”; but I should note that I have a male in splendid plumage shot in November.

Female.—The whole upper plumage brown, each feather edged with pale rufous or dirty rufous-white; wing-coverts grey; quills brown, with faint traces of the speculum, and the white terminal bar to the wing-coverts well-defined. Lower parts dull brownish-buff, varying a good deal in depth and tint, the brown bases to the feathers showing through in dark crescentic bands on the breast, flanks, and sides, but not at all or only slightly, on the abdomen; chin immaculate; neck and sides of head speckled with dark brown.

Most ducks, but not all, have a well-defined white loreal spot speckled with brown.

Colours of soft parts.—Irides brown or orange-brown; legs like those of the male, but duller at all seasons; bill dull-brown, the lower mandible dull orange or orange-brown.

“In the female, the upper mandible is dark brown, tinged reddish along the commissure and on the nail, while the lower mandible is dull orange, brownish towards the tip.

“The irides vary . . . in the female from brown to reddish brown, but I have recorded them . . . as light yellow in one female, so that there is only a general, and not a constant sexual difference in the colour.” (Hume.)

Measurements.—Length about 18·5 inches, wing 8·1 to 9·2, tail about 3·5, or less, tarsus 1·2 to 1·4, bill from gape 2·8.

“Length 18·0 to 19·0 inches, expanse 27·0 to 29·5, wing 8·0 to 8·9, tail from vent 3·5 to 3·85, tarsus 1·2 to 1·4, bill from gape 2·65 to 2·87. Weight 1 lb. to 1 lb. 7 ozs.” (Hume.)

Male in the first plumage resembles the female, but the wings are brighter-coloured; bill pale reddish brown; legs and feet flesh-coloured.

Males in their post-nuptial plumage have the white of the breast with a few dark crescentic bands, the lower belly with dark bars, and the rich black of the under tail-coverts mottled with chestnut and white.

“Young in Down resemble those of the Wigeon in having the upper parts almost uniform, with indistinct pale spots, but they possess the dark brown stripes through the eye as in the young Mallard. The bill is not widened at the tip, but it grows very rapidly.” (Salvadori.)

Distribution.—The Shoveller is to be met with at different times throughout the Northern hemisphere in all four continents. Found over practically the whole of Europe and Asia at various seasons, it extends in winter as far south as Somaliland in Africa, and in America to the 18th degree latitude north in the West Indies, and even further south in Guatemala.

The references made to its occurrence in Australia and South America apply to allied species and not to the Common Shoveller.

In India proper the Shoveller is a winter visitant to all parts, from the extreme north to the extreme south; but, though it surely must occur there at times, it has not yet been recorded from Pegu and Tenasserim.

In Ceylon it is also fairly common. Legge writes:—

“This remarkable and almost cosmopolitan Duck is a not unfrequent winter visitor to Ceylon. I have not met with it myself, but Mr. G. Simpson informs me that it comes in large numbers to Delft and the Palverainkadoo and Mullaittivu lagoons, remaining during the same period as the Teal and Pin-Tail.”

Nidification.—As regards its breeding in Indian limits, all I can find is Layard's record noted by Legge:—

"Layard not only discovered it one year near Jaffna, but found it breeding there at the Chavagacherry lagoon in March. He there met with a female with twelve young ones, most of which he captured, and in the month of November he obtained some specimens from native shooters."

This, of course, was an abnormal breeding incident in every way, time as well as locality, and it is very hard to give any reason for such a queer occurrence.

It breeds throughout their northern habitat—Asia, America, Europe—and also in parts of Northern Africa. It is said to breed very extensively in Abyssinia and also in Algeria. In Asia it breeds in Turkestan, Northern Persia, and in the whole of its northern Asiatic range. In Europe it breeds over the greater part of the continent, though absent in some countries and present in others quite as far south.

It makes a rather large, loose, and untidy nest of soft reeds, &c., lined with down, and places it on the ground in swampy land or by the edge of some piece of water in fen-land. It does not appear to frequent open water for the purposes of breeding, and selects places well away from observation and interference, and conceals its nest with great care. Hume says that the nest is a shallow depression in the soil made by the birds, and thinly or thickly lined with down or dried grass.

The description of the down with which the nest is lined, and which is, of course, taken from the bird itself, is said by Legge to be "small, dark brown, with small plainly-defined whitish centres." The eggs vary in number from seven to sixteen, eight or nine being perhaps the number most often laid.

The colour is a pale, but rather clear-tinted, yellow stone-colour; some have a creamy tinge, and others are slightly greenish, but a yellow-grey is undoubtedly the most common colour.

The texture is extremely fine and close, with a surface slightly or decidedly glossed. My eggs average $2\cdot06 \times 1\cdot4$ inches, and are in shape rather long ovals, distinctly pointed at the smaller end.

Hume's series measured from $2\cdot0$ to $2\cdot2$ inches in length, and from $1\cdot33$ to $1\cdot55$ in breadth.

Hartert records the measurements of 103 eggs as follows:—

Average	52'58	\times	37'11	(2'06 \times 1'46 inches).
Maxima	<u>56'5</u>	\times	<u>38'0</u>	(<u>1'38</u> \times 1'40 inches) and
	54'0	\times	<u>39'0</u>	(2'09 \times <u>1'51</u> inches).
Minima	<u>48'0</u>	\times	<u>37'0</u>	(<u>1'9</u> \times 1'45 inches) and
	50'5	\times	<u>35'5</u>	(1'99 \times <u>1'39</u> inches).

General Habits.—The Shoveller is not one of the earliest ducks to arrive; as a rule it comes into the more northern portions of India in the latter end of October or even early in November, and is later still in the southern parts of its range. In Bengal I think few are seen until November; in Assam, especially in the extreme N.E., I have seen them in October.

It leaves, as well as arrives, later than many ducks, and may often be met with in Cachar during April; and Hume says that some remain in the Peshawar Valley until May, and that in Kashmir they remain until quite the end of that month. Lieutenant White also obtained one in the Kurram Valley in company of three gadwall, on the 22nd of the same month.

In the extreme north of its range and in the Himalayas it is only seen whilst on migration, during the months of late September and October and early November, and again in March and April, as the birds go north. In Kashmir, however, a good number pass the whole of the winter, and Adam says that it is found throughout that season there.

Although common over the major part of the country it visits, it does not seem anywhere to be found in very large numbers, and may often be seen in pairs or even singly. I do not remember ever seeing a flock which numbered over forty, and should imagine such a flock to be rare anywhere.

As regards its haunts, these are everywhere and anywhere; but it does not care for open, deep water, and prefers small creeks, ponds, jheels, and tanks which are well covered with vegetation, and also stretches of shallow water with plentiful cover and a muddy bottom. At the same time, I *have* shot it in the very centre of large open bheels, and once on a small hill-stream.

Hume says:—

" To the shores they stick, into the open water they never seem to straggle by choice ; and if you watch them, they are for the most part either dozing on the brink, or paddling slowly in the shallows, with their entire bills and more or less of their heads under water, their heads working from side to side all the while like a Flamingo's or Spoonbill's."

I have, however, seen the Shoveller in open water, but this only rarely, and only during the heat of the day when the birds wish to sleep.

As noted above by Hume, they feed with bills and heads under water, running the former through the shallows in the mud, and so collecting the numerous small forms of animal life which there abound, and which, when the bill is lifted, are retained whilst the water filters out. They are omnivorous, and will eat almost anything, but, at the same time, animal food undoubtedly forms the major portion of their diet.

Except for the very handsome appearance of the full-plumaged drake, the Shoveller is worth little from any point of view. As an edible, it is one of the worst of the duck tribe—coarse, oily, and fishy in taste, and ranking equal to the white-eye, and inferior to the whistling-teal.

As regards its feeding and its quality, Hume writes :—

" Doubtless, in more savoury localities, such as the more aristocratic ducks frequent, insects and their larvæ, worms, small frogs, shells, tiny fish, and all kinds of seeds and shoots of water-grasses, rushes, and the like constitute their food ; but where they take up their abode on one of the village ponds, and the pond is a real dirty one, I can assert, from the examination of many recently killed birds, that it is impossible to say what these birds, will not eat.

" All ducks are more or less omnivorous, but no other ducks will, as a rule, frequent the dirty holes in which a pair of Shovellers often pass the winter."

A curious note on its food, &c., is that in Latham's ' *Synopsis of Birds*,' in which he states :—

" Its chief food is insects, for which it is continually muddling in the water with its bill. It is also said to dexterously catch flies, which pass in its way over the water. Shrimps, among other things, have been found in its stomach on dissection."

It is a bad swimmer and a worse diver, and once shot gives little trouble to bring to hand if only wounded. It flies, however, very well and strongly, and in this respect it holds its own with teal and other swift ducks, though it is slow to rise, getting up heavily and awkwardly off the water and taking time to get up its speed.

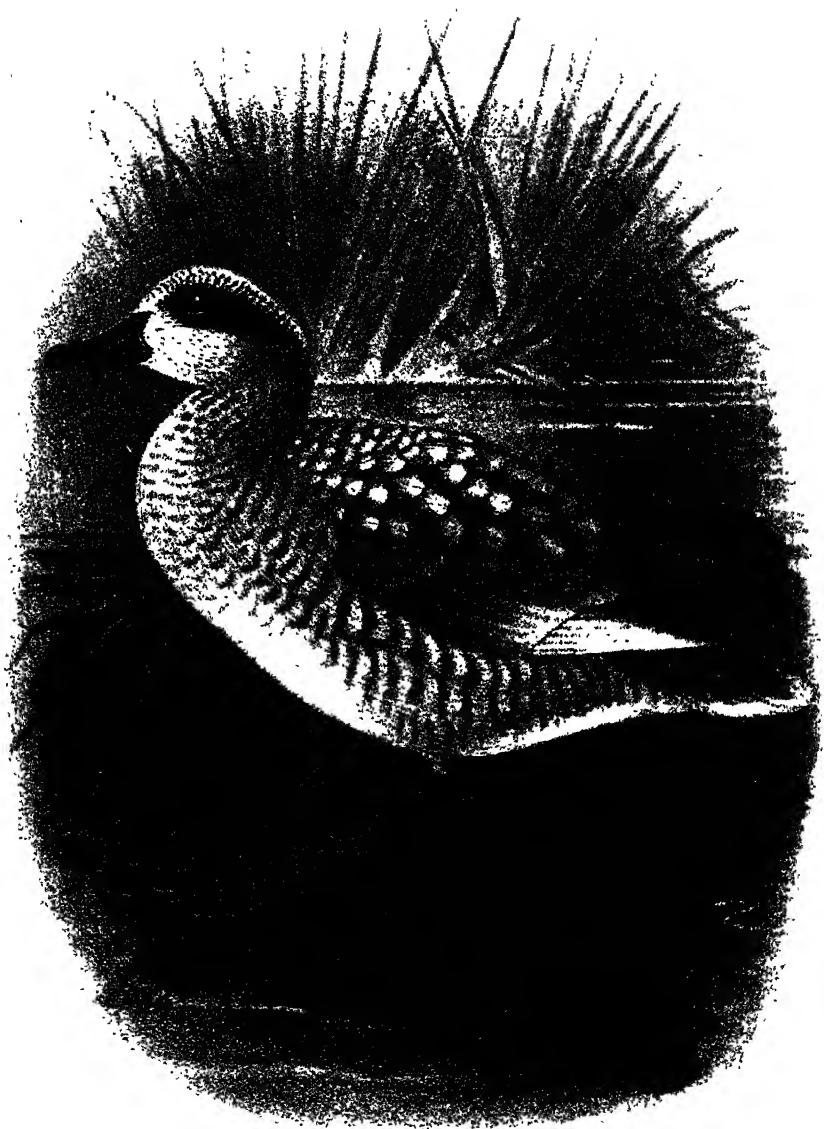
Shovellers are very sociable birds, and consort with teal, gadwall, and other ducks. As a rule, they are very tame, and can be easily approached, if the least caution is taken, and they have the reputation of allowing repeated shots to be fired at them before a flock will leave the piece of water it is frequenting.

Blanford remarks that they never appear to feed, like other ducks, with their heads and breasts immersed and their tails sticking up vertically.

They are said to walk well, with a carriage similar to that of the gadwall, and Hume says they can even run if sufficient inducement be held out for them to do so.

Newton remarks on a peculiarity of this duck of "swimming round in circles, with its bill in the water, above the spot where pochards are diving and feeding beneath, and sifting out the substances that float up when disturbed by the operation of the diving ducks."

The voice of the Shoveller is much like that of the mallard, the quack, however, being lower and less strident. In flight it gives vent to a low chuckling quack, quickly repeated, much as does the gadwall.



THE MARBLED DUCK.
Marmaronetta angustirostris.
 $\frac{1}{3}$ nat. size.

Genus MARMARONETTA.

The genus *Marmaronetta* contains a single species only, with a bill similar to that of *Nettion*, but differing from that genus in having no wing-speculum. Its colouration, which gives a silvery-grey tone to the plumage when taken as a whole effect, is quite sufficient to at once distinguish it from all other ducks, either Indian or otherwise.

(37) MARMARONETTA ANGUSTIROSTRIS.

THE MARBLED DUCK.

Anas angustirostris, *Ménétries*, *Cat. Reis. Caucas.* p. 58 (1832) (Lenkoran).

Querquedula angustirostris, *Hume*, *S. F.* i, p. 262; *Anderson*, *ibid.* iii, p. 273; *Butler*, *ibid.* iv, p. 30; *id. ibid.* v, p. 234; *Hume & Marsh. Game-B.* iii, p. 237; *Reid*, *S. F.* x, p. 82; *McLeod*, *ibid.* p. 168; *Hume*, *ibid.* p. 174.

Chaulelasmus angustirostris, *Hume*, *S. F.* vii, p. 493; *id. Cat. No. 961 bis*; *Barnes*, *B. of Bom.* p. 405; *Hume*, *Nests and Eggs* (Oates' ed.), iii, p. 291; *Barnes*, *J. B. N. H. S.* vi, p. 291.

Marmaronetta angustirostris, *Salvadori*, *Cat. B. M.* xxvii, p. 321; *Blanford*, *Avifauna B. I.* iv, p. 454; *Oates*, *Game-B.* ii, p. 273; *Stuart Baker*, *J. B. N. H. S.* xii, p. 459 (1899); *id. Indian Ducks*, p. 202 (1908); *Burton*, *J. B. N. H. S.* xxi, p. 684 (1912); *Aitken*, *ibid.* xxii, p. 807 (1914); *Logan-Hume*, *ibid.* xxiii, p. 584 (1915); *Ludlow*, *ibid.* xxiv, p. 368 (1916); *Berthon*, *ibid.* xxvi, p. 674 (1919).

Description. **Adult Male.**—Whole upper parts a silvery-grey, each feather having the central portion darker and brownish and the tip and terminal edge paler; the head and nape are more buff in tint, and have each feather centred brown, giving a barred appearance; the parts surrounding the eye brown, forming a distinct dark-brown eye-patch; chin, throat and

under-part of the neck paler, almost white, with the dark centres much reduced and forming only a stippling; lower parts white, more or less tinged with buff and grey, and also barred with dark grey-brown on the breast, flanks and sides, and less distinctly on the lower tail-coverts. Tail a silvery brown-grey, edged paler; wings silver-grey, the outer secondaries a purer, paler colour, and the inside of the primary-quills darker and browner; all the feathers, coverts, and quills have the shafts brown, distinctly showing against the grey.

Colours of soft parts.—“The legs and feet are dusky-olive or dark horny-brown with the claws and webs black, or horny-green with the webs and claws dark-grey; the bill bluish-grey, black on the culmen and tip or dusky, bounded at the margins of the feathers on the forehead and cheeks with a pale leaden-blue line, continued along the margins of both mandibles to near the tip, and a spot of the same colour just above the nail; the irides are brown.” (*Hume.*)

Measurements.—“Length 18.3 to 19 inches, expanse 28.5 to 29.5, tail from vent 3.6 to 4.0, wing 8.1 to 8.5, wings when closed reach to 0.7 to 1.5 of end of tail, bill at front, including nail, 1.77 to 1.85, tarsus 1.44 to 1.52. Weight 1 lb. 3 ozs. to 1 lb. 5 ozs.” (*Hume.*)

Female.—Only differs from the male in being smaller, having the eye-patch less pronounced, and the general plumage duller and more uniform in colour; the crest also is less developed.

Colours of soft parts.—“Legs and feet greenish-plumbeous; irides dark brown; bill dusky-plumbeous, darkest on the culmen.” (*Butler.*)

Measurements.—“Length 16.9 to 17.5 inches, expanse 27 to 28, tail from vent 2.8 to 3.7, wing 7.9 to 8.1, wing when closed reaches to within 0.5 to 1.0 of the end of the tail, bill at front 1.6 to 1.75, tarsus 1.4 to 1.5. Weight 1 lb. to 1 lb. 3 ozs.” (*Hume.*)

“Length 15.75 inches, expanse 26.5, wing 7.62, tail from vent 2.75.”

Young.—“Similar to the female, but all the markings and tints still duller; the lower parts almost uniform dull pale greyish.” (*Salvadori.*)

A young female obtained by Major Olivier, and now in the Bombay Natural History Society's collection, has the wing only 7.42 inches, but at the same time has the bill about 1.8.

Distribution.—The range of the Marbled Teal extends from the countries to the west of the Mediterranean Sea, through those bordering it north and south into Western Asia, India being its eastern limit; it is also found in the Canaries.

As regards India Hume wrote in ‘Game-birds’ :—

“Its normal range with us (it is presumably only a cold weather visitant) appears to be the whole of Sind (from every Collectorate in which it has been reported, and where it is extremely common) and

Northern Guzerat, the Southern part of the Dehra Gazi Khan District and of Bhawalpur, in all three of which it is a regular but less abundant visitant. No doubt it will be met with in Kutch and Kathiawar, but it has not been thence recorded as yet.

"But outside these limits it occurs much farther east as a traveller. I have had specimens from Western Oodeypore and from near Delhi. The late Mr. A. Anderson procured it in the Northwest Provinces, at Futtehgarh, and in Oudh near Hurdui, and I myself procured two freshly-killed specimens in the Calcutta market, the one in December and the other in February, which had been captured about twenty-two miles south-west and some eighteen miles west, respectively, of the metropolis."

Since this was written the Marbled Teal has been obtained in Kutch, several times again about Delhi, by Brookes in Ferozepore, Burton in Baroda, Logan-Hume near Nowshera, Berthon in Kathiawar, H. C. Wright in the Nall, and more than once also in the Calcutta market, but nothing has been recorded, that I can find, which in any way extends the original area as given by Hume. A specimen lent me from the Bombay Nat. Hist. Society's collection has no locality given on its ticket, but was presumably collected in one of the places above-mentioned.

I should note that when showing this specimen to a friend, he at once said that he had shot two birds of the same kind in Gowhatta, Assam; he said that neither he nor any of the men to whom he showed them had ever seen the duck before, and could not name it. He was very sure of its being the same species. Later, about 1912, a specimen was killed at Sibsagar in Assam and sent to me for identification, proving to be of this species.

Nidification.—Mr. B. Alexander found this bird breeding plentifully in the Cape Verde Islands, and it appears to breed on the greater portions of its habitat round the Mediterranean. Although breeding in latitudes so far south, it is unusually late in breeding, May and June being the months in which the eggs are laid. It is said to make a rough nest, much like that of the common teal, and to place it amongst rushes on land surrounding swamps and various kinds of water, and also on the sea-shore, this last more especially in Spain. Of this latter country Colonel Irby thus records its nesting in Andalusia:—

"The Marbled Duck breeds during the last week in May, nesting in patches of rushes. The nest is like that of a teal, containing a good deal of the down from the breast of the female; and eleven eggs appear to be the usual complement. The latter much resemble those of the common teal, being of a yellowish-white colour. Favier states that (near Tangiers) they also nest in rushes during May and June, and that incubation lasts from twenty-five to twenty-seven days."

The eggs which Colonel Butler received from the Mekran Coast are, in all probability, rightly identified by him as being those of the Marbled Teal. He says:—

"I received some small duck's eggs from the Mekran Coast, which are, in my opinion, those of the Marbled Duck. The nest was on the ground under a solitary babool bush, growing on an extensive tract of salt marsh, some seven or eight miles north of Ormarra, called Moorputty, and consisted, according to the account of the native who found it, of a collection of fine twigs formed into a solid pad with a few pieces of down as a lining, and measuring eight or nine inches in diameter.

"The eggs, eight in number, and of a delicate cream-colour, were taken on the 19th June, 1878. I have carefully compared them with eggs of the Marbled Duck, and find that they agree exactly, both in size, colour and texture. They are certainly not Garganey's eggs, being too large; I know of no other duck inhabiting that district they could possibly belong to except the present species.

"They vary in size from 1.8 to 1.9 inches in length, and from 1.35 to 1.43 in breadth."

Barnes, in his article on 'Nesting in Western India,' noted that he, too, had received some eggs from the Frere Museum which had come from the Mekran Coast about the same time as those received by Colonel Butler. He describes them as being of a creamy-white, much soiled and dulled by lapse of time, but he does not give their dimensions.

The first absolutely certain record, however, of this bird's breeding in India, is that of Mr. A. B. Aitken, who writes:—

"On the Khushdil Lake, near Pishin, the largest proportion of the few ducks left were Marbled Teal, which had apparently made up their minds to breed. About June I observed a couple of birds which had paired off frequenting a small island. These two remained together and did not stay with the other Marbled Teal. I did not find their nest. I think it was in August, though I do not recollect the date, that while in a boat on the lake, on

rounding a point on the same island, I disturbed a duck which entered the water with fourteen ducklings about a week old. I gave chase, and the duck went through the well-known tactics of her kind by pretending that she was wounded and lagging behind her ducklings. She gradually made off in a direction away from her ducklings. She let the boat come within a yard of her, and she was undoubtedly a Marbled Teal. When she thought her ducklings were a safe distance from us, she rose quite easily and made off."

Ludlow also gives a most interesting account of this bird's breeding on the Sonmeani bheel, about fifty miles from Karachi, in the Las Beyla State of Baluchistan. Apparently quite a number of these ducks breed here annually, provided there is sufficient water, which is not always the case, and Mr. Ludlow's collectors assured him they had seen at least a dozen nests from which the broods had hatched out, and they succeeded in catching two young ducklings for him. They also found two clutches of eggs, one of twelve incubated, one of nine fresh.

In Persia, it should be noted that hard-set clutches of five and six eggs were taken.

General Habits.—Many birds are resident in N.E. Sind and Baluchistan, but as regards the migratory birds, this appears to be later in its arrival than most ducks, even at its extreme north-west point of entry; it does not appear to be seen in any numbers until late in October or early November, and as it works south and east, it, of course, gets later and later. Its departure would, on the other hand, seem to take place at much the same time as that of other birds of its order, i.e., in April, a few remaining until the last few days of May in very late years.

Hume wrote concerning the habits of this teal as follows :—

"In Sind, where I had abundant opportunity of observing it, I found the Marbled Teal invariably associated in large parties. Its favourite haunts were broads, thickly grown with rush, in which it fed and sported, comparatively seldom showing itself in the open water. As a rule, it does not at once rise when guns are fired, as the other ducks do, but if by chance it is at the moment outside of the rushes or similar cover in the open water it scuttles into concealment as a coot would do, and if in cover already, remains there perfectly quiet until the boats push within 60 or 70 yards of it; then it rises, generally one at a time, and, even though fired at, not unfrequently

again drops into the rushes within a couple of hundred yards. When there has been a good deal of shooting on a lake and almost all the other duck, and with them, of course, *some* of these, are circling round and round, high in the air, you still keep, as you push through the reeds and rushes, continually flushing the Marbled Teal, and the broad must be small, or the hunting very close and long continued, to induce all the Marbled Teal to take wing. Of course, where there is a little cover (though there you never meet with this duck in large numbers) they rise and fly about with the other ducks, but their tendency in these respects is rather coot-like than duck-like. Individuals may take wing at the first near shot, but the great majority of them stick to cover as long as this is possible; and on two occasions I saw very pretty shooting, boats in line pushing up a wide extent of rush-grown water, and the Marbled Teal rising every minute in front of us at distances of 60 or 70 yards, like Partridges out of some of our great Norfolk turnip-fields; here and there a Shoveller or a White-eyed Pochard, both of which, when disturbed, cling a good deal to cover, would be flushed, but there was not one of these to ten of the Marbled Teal. The flight of this species, though Teal-like, is less rapid and flexible (if I may coin an expression to represent the extreme facility with which that species turns and twists in the air) than that of the Common Teal. It more nearly resembles that of the Garganey, but is less powerful and less rapid even than that of this latter species. There is something of the Gadwall in it, but it wants the ease of this. It flies much lower, too, and, as already mentioned, much more readily resettles after being disturbed. I have hardly ever seen them swimming in the open, and in the rushes they make, of course, slow progress. When wounded they dive, but for no great distance, and then persistently hold on under water in any clump of rush or weed, with only their bills above water. I have never seen them on land in a wild state, but some captured birds, whose wings had been clipped, walked very lightly and easily; and though they had been but a few days in confinement, they were very tame, and could, I should imagine, be easily domesticated.

"In Spain, they are described as very wary, and there they seem to frequent open water; here they avoid this latter as a rule, and are, I should say, amongst the tamer of our ducks.

"Their food is very varied here. Favier says that, in Tangiers, they feed on winged insects; in Sind, the major portion of their food consists of leaves, shoots, rootlets, corms and seeds of aquatic plants, intermingled with worms, fresh-water shells, insects of all kinds and their larvae. I believe I found a small frog in the stomach of one, but it is not noted on the tickets of any of the specimens now in the Museum, and I cannot be quite sure."

The voice has been variously described as a whistling croak, a low croaking whistle, a rather hoarse quack, and a quack like that of the domestic duck, but very harsh and abrupt. It is probable that these descriptions apply to two notes, and that this duck, like some others, has two distinct calls, one more or less of a whistle, the other somewhat of the nature of a quack.

It is practically omnivorous and as an article of diet itself it is not first-class.

Sub-family FULIGULINÆ.

This sub-family is divided from those already written about by having the hind-toe broadly lobed, whereas the latter have the hind toe either with no lobe at all or else with only a narrow one. Blanford does not divide the *Fuligulinæ* from the *Anatinæ*, but the division seems to be a natural one, the members of this sub-family differing from those of others, not only in construction, but considerably in habits as well.

The separation of the genus *Oxyura* is by no means so distinct, and the genus, in my opinion, is hardly worthy of separation from the *Fuligulinæ* and the honour of a sub-family to itself, but for the present I retain it in this position.

Oxyura differs from the ducks included by Salvadori in his sub-family *Fuligulinæ* in certain external structural particulars, principally in the swollen base to the upper mandible and in its remarkable tail, which, as Blanford remarks, looks as if it might be that of a woodpecker.

The *Merginæ* are separated from all other ducks, by the shape of their bill, which is long, narrow, and pointed, altogether most un-duck-like in its appearance.

The *Fuligulinæ* comprise thirteen genera, of which three only are represented in India; but it is worthy of notice that whilst *Netta* is one of the most common forms and *Glaucionetta* one of the most rare, *Nyroca* and *Fuligula* contain some forms which are extremely common, and others again of the greatest rarity.

Key to Genera.

- a. Primaries with the bases more or less white.
 - a'. Lamellæ long and prominent *Netta*, p. 249.
 - b'. Lamellæ short, well apart, not very prominent.
 - a''. Bill very nearly the same width throughout . . *Nyroca*, p. 258.
 - [b''. Bill distinctly wider at the tip than at the base . *Fuligula*, p. 258.]
 - 3. Primaries without any white or whitish at the base *Glaucionetta*, p. 291.



THE RED-CRESTED POCHARD.
Netta rufina.

male

female

Genus NETTA.

The genus *Netta* contains but one species, distinguished by its bill, which tapers very gradually throughout its length and has the lamellæ very stout and prominent.

The male bird also has a full bushy crest, which, however, is not present, or is considerably modified, in the female.

The name Pochard should be pronounced "Pokard," not with the soft *ch* with which I have heard many sportsmen sound it. In many parts of England these ducks are known as Pokers or Poke Ducks, and it is from this that the name is derived.

(38) NETTA RUFINA.

THE RED-CRESTED POCHARD.

Anas rufina, *Pal. Reis. d. versch. Russ. Reichs.* ii, p. 713 (1773) (Caspian Sea).

Branta rufina, *Jerdon, B. of I.* iii, p. 811; *Butler, S. F.* iv, p. 30; *ibid.* v, p. 234; *Fairbank, ibid.* iv, p. 264.

Fuligula rufina, *Hume, S. F.* i, p. 264; *Adam, ibid.* p. 402; *Hume, ibid.* vii, pp. 98, 493; *Hume & Marsh. Game-B.* iii, p. 253; *Legge, B. of C.* p. 1087; *Butler, S. F.* ix, p. 438; *Reid, ibid.* x, p. 84; *Taylor, ibid.* pp. 528, 531; *Barnes, B. of Bom.* p. 412; *Hume, S. F.* xi, p. 346; *Ball, ibid.* p. 232; *Cripps, ibid.* p. 402; *Hume, Cat. No.* 967.

Netta rufina, *Salvadori, Cat. B. M.* xxvii, p. 328; *Blanford, Avifauna B. I.* iv, p. 456; *Oates, Game-B.* ii, p. 299; *Stuart Baker, J. B. N. H. S.* xii, p. 249 (1899); *id. Indian Ducks*, p. 208 (1908); *Hopwood, J. B. N. H. S.* xviii, p. 433 (1909).

Description. Adult Male.—Whole head reddish-bay, richest and darkest on the under surface and sides, paling from the forehead to the end of the crest, where it is reddish-buff. Neck blackish-brown; upper back dark-brown, getting more and more pale towards the rump, the bases of the feathers next the scapulars showing in a white band; rump and upper tail-

coverts blackish-brown, more or less glossed green; tail silvery grey-brown; breast blackish-brown, paling on the lower breast and abdomen; under tail-coverts dark-brown; flanks, axillaries, and under wing-coverts white; coverts bordering the wing and running into the scapulars white; other coverts greyish-brown; secondaries white, sometimes tinged grey or creamy, with a subterminal band of brown from 2·5 to 4 inches wide; inner secondaries like the coverts; outermost primary brown on the outer web and inside of the inner web and tip, the remainder white, this white gradually increasing in extent on each primary until the innermost primaries are all white with a broad brown tip.

Colours of soft parts.—Bill vermillion-red; the nail whitish, tinged pink or sometimes yellowish, the base next the feathers of the forehead and the gape more or less dusky-brown except in the oldest birds; legs and feet orange, orange-red, or dull fleshy-red; irides deep or light reddish-brown to bright light red.

"In the adult male the bill is a brilliant crimson, sometimes inclining to vermillion; the nail brown or white, tinged with brownish-horn, or pink horny-brown or yellow at tip. There is often a dusky shade round the nostrils; the gape is often blackish, as is likewise the base of the lower mandible and the basal portion of the membrane between its rami; but these are all traces, I think, of immaturity.

"The legs and feet are dingy salmon-colour or reddish-orange, dusky on the joints and blackish on the webs; but in slightly younger but full-plumaged birds the legs and feet will be olivaceous-orange, or, lastly, dusky with a reddish tinge.

"The irides vary from brown to red (this latter being the colour in the old adult) and are at different ages brown, brownish-yellow, reddish-brown, orange, orange-red, and bright-red."

Measurements.—"Length 20·5 to 22·1 inches, expanse 34·0 to 38·2, wing 10·0 to 10·75, tail from vent 3·0 to 4·2, tarsus 1·5 to 1·7, bill from gape 2·3 to 2·42. Weight 1 lb. 12 ozs. to 2 lbs. 14 ozs." (*Hume*.)

Female.—Above pale greyish-brown distinctly tinged with ochre; the crown rather darker; scapulars paler; the feathers of the upper surface with pale margins, practically absent in the older birds; the wings paler and duller but otherwise like those of the male, the white being replaced by pale grey or dusky-white; whole lower plumage, under wing-coverts, and axillaries pale greyish-white, yellowish-white, or greyish-ochre, darker on the flanks.

Colours of soft parts.—Bill dusky-black, becoming red towards the tip and with the nail still paler, the lower mandible only dark at the base and up the fleshy part in the centre; irides brown or reddish-brown; the webs and joints darker, often dusky-black.

"In the female the bill is black, reddish or orange towards the tip and more or less along the sides of the lower and edges of the upper mandible." (*Hume*.)

"Iris yellow ; bill brownish-red above, fleshy beneath, nail brown ; legs and feet murky-yellow." (*Legge.*)

Measurements.—"Length 20·1 to 22·0 inches, expanse 33·75 to 37·0, wing 9·0 to 10·25, tail from vent 3·5 to 3·8, tarsus 1·5 to 1·75, bill from gape 2·25 to 2·4. Weight 1 lb. 10 ozs. to 2 lbs. 6 ozs." (*Hume.*)

"Young male similar to the female, but the darker centres of the feathers of the underparts are brown, instead of grey ; back and breast darker brown ; and more indications of a crest." (*Seeböhm.*)

Colours of the soft parts are those of the female, the legs and feet being less tinged with red or orange, often of a uniform dull brown, barely tinged on the shanks with reddish ; the irides are plain brown. The bill becomes redder before the full plumage is assumed, but does not become really red or crimson-red until the bird is practically adult.

"Males in first nuptial dress have the underparts more suffused with brown, the white not suffused with pink, and the bill much paler." (*Seeböhm.*)

"Males in moulted plumage very closely resemble the adult females, but may be distinguished by the brighter colour of their bills and eyelids, by the greater development of their crest, by the darker brown of the belly and under tail-coverts, and by the redder colour of the feet." (*Salvadori.*)

"Young in Down are described by Baldamus as having the upper parts dull olive-grey with a buff spot on each shoulder, and the underparts buff ; a buff stripe passes over each eye, and through the eye runs a dark stripe, which divides into two behind the eye." (*Salvadori.*)

Distribution.—The habitat of the Red-Crested Pochard may roughly be said to be the countries surrounding the Mediterranean and Central Western Asia.

It is common in South Russia, Turkestan, Persia, Afghanistan, Baluchistan, and thence, in winter, in India. Throughout the countries of southern Europe it is common, and it ascends north as a frequent straggler to Northern France, England, occasionally as far as Scotland, North Germany (where it breeds), and Central Russia.

On the south coast of the Mediterranean it is much less common. It is rare in Egypt and Tangiers, more common in Algiers, and east of Algiers, but has not been recorded further west.

In India, the Red-Crested Pochard occurs practically throughout the whole of the north and Central India. It is common in the North-west Provinces, the Punjab, Sind, Rajputana, and Orissa, and Central India, and the Central Provinces, except in the south, and

Naturally it is principally a vegetable feeder, and when feeding on water-plants and young crops its flesh is excellent; but when, as is sometimes the case, it feeds on fish, shell-fish, water-insects, &c., they at once assume a rank fishy taste which no amount of seasoning will obscure.

Hume found one which had gorged itself on small fish about an inch in length, and I dissected one which had eaten, as far as I could see, nothing but the tiny red crabs which swarm in such countless myriads along the shores of rivers, swamps and backwaters in the Sundarbans, the waters of which are brackish. This was the only specimen the contents of whose stomach I noted whilst shooting in Jessore and Khulna; but all we shot and tried to eat tasted the same, and I have no doubt that they, too, had been feeding on crabs.

In Cachar and Sylhet I found the Red-Crested Pochard one of the very best of ducks for the table, and the same held good in the Dibrugarh and adjoining districts of Assam.

They are strong flyers and go at a good pace, but they are very slow in getting off the water, and take some time to get their pace up.

Finn says that their note is a harsh croak sounding like "kurr." This is the same syllable used by Hume to represent their note, he calling their note a "deep, grating kurr." He also adds:—

"Occasionally the males only, I think, emit a sharp sibilant note—a sort of whistle, quite different from that of the Wigeon, and yet somewhat reminding one of that."

From a sporting point of view, the Red-Crested Pochard is all that can be desired. About as smart as they make them, he seems to have special aptitude for judging the length of range of different guns; and a flock may be caught once, but seldom twice, whatever distance the gun may reach.

It swims so fast that it can by this means alone often escape and it is often very loath to rise when it can thus get out of shot. Its swimming powers, manner of packing, and capacity for diving are so well shown by Hume's account of his shooting in the Etawah district that yet again I indent on him wholesale:—

"All night long . . . I had heard water-fowl coming in, and the next morning, before dawn, I was out in my punt, working softly

round the margin to the western side, so as to have the fowl, when twilight broke, against the daylight sky. . . . I soon made out by their cries that the mass of the fowls were Pochards, that there were a vast number of them, and that a great number of them belonged to the present species. Day dawned, and I could see a dense mass of fowl . . . probably fully a quarter of a mile off. . . . lying down I paddled towards them. Very soon a fresh north-west wind sprang up against me. Quite a sea rose. I was perpetually grounding, and they were swimming away steadily against the wind, so that it was bright sunlight before I got within 200 yards, and then I could see they were all Red-Crests. I had now got into deeper water, and went as hard as I could without splashing; but they swam steadily away, and I must have gone fully half a mile before I had gained 100 yards on them. Still, they had not shown the slightest signs of suspicion (and I knew their ways well), but were swimming gaily on *en masse*, head to wind, as they often will on windy mornings. On I went. I had a long heavy English swivel, carrying a pound of shot (No. 1 I had in); there were between two and three thousand of them, as closely packed as they could swim. I was certainly within 70 yards of the hindermost bird; I calculated to get within 40 yards of these and fire over their heads into the centre of the flock. They were closely packed and backs to me, so there was little to gain, and possibly a great deal to lose, by flushing them. I was within 50 yards when again I grounded; had I even then fired at once I must have made a very large bag, but I thought I knew that this was only a point of a mound, and I wasted some precious moments struggling to get over it with the paddles. The nearest birds must have been 70 yards distant before, seeing I was hard and fast, I snapped an ammunition cap on a little pistol I always carried for the purpose, and raked them as they rose. The next instant there was a whole line of birds fluttering on the water, seven dead, and twenty-one winged. I recovered every one of them, but it was noon before I bagged the last; and if I had had a desperate hard six hours' work, I hardly remember any six hours which I more thoroughly enjoyed."

Genus NYROCA.

The genus *Nyroca*, with which I include the Scaup and Tufted Pochard, formerly placed by me under the genus *Fuligula*, contains about a dozen species and subspecies, of which five are found within Indian limits.

From *Netta* the present genus differs in having smaller lamellæ, placed further apart and less prominent. The genus is a cosmopolitan one, and contains one of our most common ducks, the White-eye, and one of our rarest, the Scaup.

Key to Species and Subspecies.

A. Sides of bill practically parallel throughout.

- a. Back and scapulars distinctly barred or vermiculated *N. ferina* ♂.
- b. Back and scapulars merely speckled.
- a'. Head and neck dull chestnut or bay *N. n. nyroca* ♂.
- b'. Head and neck almost black *N. n. baeri* ♂.
- c. Upper back and head rufous-brown, scapulars slightly vermiculated, no white speculum *N. ferina* ♀.
- d. No vermiculations on upper plumage, a white speculum.
- c'. Head and neck rufous-brown *N. n. nyroca* ♀.
- d'. Head and neck mixed with blackish on the sides *N. n. baeri* ♀.

B. Bill increasing in width towards the end and narrower at base.

- e. Head never crested, back and scapulars in adult not black *N. marila*.
- f. Head always more or less crested and scapulars in adults black, more or less sprinkled with whitish *N. fuligula*.

N. n. nyroca is a smaller bird than *N. n. baeri*. In the former the wing is always below 7·5 inches, in the latter nearly always above 7·5 inches.

Young specimens of the Tufted Pochard (*fuligula*) have not always a very distinct crest, but Mr. Finn has pointed out to me a very distinctive character in this duck, and this is the wonderful silky or satiny whiteness of the lower parts. Even when the white is not very pure, the satin-like texture is most apparent, and serves at once to separate the Tufted Pochard from all others.



THE POCHARD OR DUN-BIRD.
male Nyroca ferina.
female size.

(39) NYROCA FERINA.

THE POCHARD OR DUN-BIRD.

Anas ferina, L., S. *Nat.* x. ed. i, p. 126 (1758) (Sweden).

Aythya ferina, *Jerdon, B. of I.* iii, p. 812; *Hume, S. F.* i, p. 264; *Adams, ibid.* p. 409; *ibid.* ii, p. 341; *Butler, ibid.* iv, p. 30; v, p. 284; *Ball, ibid.* vii, p. 282.

Fuligula ferina, *Davids. & Wend. S. F.* vii, p. 93; *Hume, ibid.* p. 496; *id. Cat.* No. 968; *Hume & Marsh. Game-B.* iii, p. 347; *Legge, B. of C.* p. 1090; *Butler, S. F.* ix, p. 438; *Reid, ibid. x.* p. 84; *Davids. ibid.* p. 326; *Taylor, ibid.* p. 581; *Barnes, B. of Bom.* p. 412; *Hume, S. F.* xi, p. 346.

Nyroca ferina, *Salvadori, Cat. B. M.* xxvii, p. 335; *Blanford, Avifauna B. I.* iv, p. 458; *Oates, Game-B.* ii, p. 309; *Stuart Baker, J. B. N. H. S.* xii, p. 603 (1899); *id. Indian Ducks*, p. 217 (1908); *Hopwood, J. B. N. H. S.* xviii, p. 433 (1909); *Harington, ibid. xxi*, p. 1088 (1912); *Bell, ibid. xxii*, p. 400 (1913).

Description. Adult Male.—Whole head and neck rich deep chestnut, changing rather abruptly into the black of the upper back and breast; rump and upper tail-coverts dull-black; remainder of upper plumage extremely pale clear grey, very finely vermiculated with black bars; wing-coverts dark grey, more or less vermiculated with white; primaries dark-grey, edged outwardly and tipped blackish; secondaries forming a dull-grey speculum, the feathers narrowly tipped whitish and divided from the inner secondaries by narrow black borders to two or three of these feathers; lower breast blackish, the feathers more or less fringed white; remainder of lower plumage white or very pale grey, sparsely stippled with black, the stipplings more numerous towards the vent and flanks; under tail-coverts dull-black; tail dull greyish-brown, tipped paler.

Occasionally the male has a pure white spot at the apex of the chin, a skin lent me by the Bombay Natural History Society having the spot more highly developed than in any other specimen I have ever seen.

Colours of soft parts.—Irides yellow or reddish-yellow; base and end of bill black, intermediate portions varying from pale clear plumbeous-blue to rather dull dark-plumbeous; the legs vary through the same shades of grey or plumbeous-blue, dark and blackish on the joints and webs.

“ The irides vary; they are generally orange-yellow, but I have noted them brown in one apparently adult female and lac-red in an old male.

“ The legs and feet are pale bluish or slaty-grey, or dull-leaden, often

darker on the joints, and with the webs black or nearly so. The bills are black and bluish-grey or leaden, in varying proportions. In some the whole bill is black, with only a leaden-coloured crescentic bar on the upper mandible towards the tip. In others only the tip and the basal portion of the upper mandible to a little beyond the nostrils are black, and the whole intervening portion of the upper mandible is leaden-blue; and between these two extremes the breadth of the blue band or bar varies."

Measurements.—"Length 18 to 20·5 inches, expanse 29·4 to 32·2, wing 8·5 to 9·5, tail from vent 2·35 to 3·2, tarsus 1·4 to 1·5, bill from gape 2·15 to 2·29. Weight 1 lb. 13 ozs. to 2 lbs. 5 ozs." (Hume.)

Adult Female.—Forehead and crown dark-brown, fading to dull fulvous-brown on the hind-neck, sides of the head and neck, and thence to pale fulvous-grey, or greyish-white, on chin, throat, and fore-neck; back and scapulars greyish-brown, with greyish vermiculations mixed with black, the vermiculations varying very much in extent and being sometimes almost wanting; lower back, rump, and upper tail-coverts blackish, the external feathers of the rump with a few fine white bars; tail and wings as in the male, but the latter much duller and less vermiculated; whole lower parts pale dull-grey, tinged with rufous-brown on the breast and sides, and darker brown towards the vent and under tail-coverts.

Colours of soft parts.—Irides dull yellow, rarely brown; bill as in the male, but generally with the blue more restricted in extent and of a duller shade; legs and feet similar to those of the male, but duller on the average.

Measurements.—"Length 17·25 to 18 inches, expanse 28·75 to 31·5, wing 7·9 to 8·3, tail from vent 2·2 to 3·1, tarsus 1·4 to 1·5, bill from gape 2 to 2·19. Weight 1 lb. 5 ozs. to 2 lb. 4 ozs." (Hume.)

Young Males resemble the females, but have the head much more reddish and also paler, and, according to Finn, are usually browner below.

The Male in undress retains much of his full colour, merely getting "a browner head, a dark pencilled-grey breast, and duller tail-coverts." (Finn 'Asian.')

"**Males in first nuptial dress** differ from the adults in having the chestnut of the head and neck paler, and the black of the breast and upper back replaced by dark brown."

"**Young in Down**, according to Naumann, are dark brown on the upper parts, shading into rusty brown on the head and neck; under parts dirty yellowish-white; bill and feet light bluish; irides grey." (Salvadori.)

Distribution.—The Pochard, Red-headed Pochard, or Dun-bird, as it is variously called, has a very wide distribution, practically throughout the Palaeartic region from Iceland to Japan. It breeds almost throughout the more southern portions of this area, but

very rarely to the east, not at all to the extreme east, and it winters throughout Southern Europe and Asia, and also in Northern Africa. Seebohm ('Birds of the Japanese Empire') says:—

"The Pochard occurs both in Yezzo and the more southerly Japanese islands, but whether it be resident or only a winter resident there seems to be no evidence to determine."

Finn, in his popular articles on ducks in the 'Asian,' thus defines its Indian area:—

"It visits Northern India in large numbers; further south it is less common, but occurs as far as Bellary. It has not been obtained in Mysore, or further south, nor in Ceylon; but it is not uncommon in Assam and Manipur, and has recently been recorded from the neighbourhood of Mandalay."

This last record probably refers to the three birds shot at Mandalay by Captain T. S. Johnson, in a miscellaneous bag of 562 ducks and geese, and mentioned by Oates in p. 310 of his 'Manual of Game-Birds.'

It is probable that it visits North Burma and the independent Burmese States in considerable numbers, for it is common in Manipur, whence a large proportion migrate towards Burma, and not through Cachar and Sylhet. Hopwood reports it from Arakan and Harington from Bhamo.

I have had it now reported to me from Mysore, where, however, it would only appear to be met with on very rare occasions, and Captain E. O. King sent a specimen from Bangalore to the Bombay N.H. Society. Hume notes that it has not been recorded from Cachar or Sylhet, but it is fairly common in both districts.

From Kashmir it has also been recorded as forming an item in a large bag made by three guns in that state, and again in the 'Asian' of the 8th of February, 1898, two Dun-birds are said to have formed part of a bag of 508 duck and teal shot by A. E. W. in the same state.

Nidification.—The Pochard breeds extensively over Europe and even in northern Africa, in Algiers. It has also been reported as breeding in Egypt, but probably by mistake. It also breeds in the western half of North Central Asia.

It makes its nest beside water—generally right at the edge

and fishy taste, though when shot inland on its more ordinary haunts, it is very uniformly excellent in flavour. Its bad flavour is, of course, due to its food, which, when it takes to the seashore, consists of tiny marine shell-fish, fishes, &c.; whereas, when in fresh water, it consists mainly of a vegetable diet, though, like all ducks, it is more or less omnivorous.

A near relation to this bird is the famous canvas-back of America, so dear to the epicures of that continent, differing little from our bird in colouration, though it is rather larger, and also slightly paler below. So close are the two birds in appearance, however, that as Finn relates, a wretched poult erer in England, who had received, and was selling, a consignment of canvas-backs from America in ice, was prosecuted for selling Pochards out of season.

It is a fine, rapid, and graceful swimmer, the water—not land or air—being its real element. Finn notes:—"This pochard swims particularly low in water, and very much down by the stern."

It is, of course, like all other pochards, a wonderful diver, and the greater part of its food is obtained by diving; but the birds will also dive and swim after one another in play, and Hume remarks that when thus playing they seem to sit far more lightly on the water than at other times.

Their powers of flight are not equal to those of swimming and diving; once on the wing, they go away at a good pace, but they are slow off the water and awkward as well.

Hume noticed that when there is a wind they always, if possible, rise against it. This is not, however, I think, typical any more of these ducks than it is of most, if not nearly all, water-birds, as well as many land ones. In the old days, when adjutants were so common in Calcutta, one could, during the rains, watch one or more any day getting up off the *maidan* there, first expanding its huge wings and then going off in ungainly strides until the wind worked against it and under its broad sails, when a lusty kick or two shot it off the ground.

On land, too, Pochards are very clumsy and slow, though they walk well enough when pushed to it.

Principally night-feeders, they also feed throughout the day,

except in the hottest hours, where they are not interfered with. Hume once or twice caught them feeding on wild rice on land, but their feeding thus is, I should think, quite exceptional, and nearly all their diet is one obtained from fairly deep water amongst roots and similar things.

Normally they would appear to be neither very shy nor yet very tame, but it takes very little shooting to make them most decidedly the former; and then, owing to their keeping so much in the centre of the water they frequent, they are by no means easy to get within shot of.

I do not remember ever to have heard the Pochard utter any sound other than that characterized by Hume and other writers as "*kurr-kurr.*" It is like that of the white-eye, but harsher and louder.

Latham, in his 'Synopsis of Birds,' says that it "has a hissing voice. The flight is rapid and strong; the flocks have no particular shape in flying, but are indiscriminate."

This flying *en masse*, and not in line or V-shape, would appear to be typical of all the true pochards.

(40) NYROCA NYROCA NYROCA.

THE WHITE-EYED POCHARD OR WHITE-EYE.

Aythya nyroca, *Jerdon*, *B. of I.* iii, p. 813; *Hume, Nests and Eggs*, p. 645; *id. S. F.* i, p. 265; *Adam, ibid.* p. 402; *Butler, ibid.* iv, p. 30; v, p. 234; *Davids. & Wend. ibid.* vii, p. 93; *Ball, ibid.* p. 232.

Fuligula nyroca, *Hume, S. F.* vii, p. 493; *ibid. Cat. No. 969*; *Scully, S. F.* viii, p. 363; *Hume & Marsh. Game-B.* iii, p. 263; *Vidal, S. F.* ix, p. 93; *Hume, ibid.* p. 259; *Butler, ibid.* p. 439; *Reid, ibid.* x, p. 84; *Davidson, ibid.* p. 236; *Taylor, ibid.* pp. 528, 531; *Outes, B. of B. B.* ii, p. 287; *id. Nests and Eggs* (2nd ed.), iii, p. 292; *Barnes, B. of Bom.* p. 413; *Hume, S. F.* xi, p. 347; *Sinclair, J. B. N. H. S.* xiii, p. 192.

Nyroca ferruginea, *Blanford, Avifauna B. I.* iv, p. 460.

Nyroca africana, *Salvadori, Cat. B. M.*, xxvii, p. 845; *Stuart Baker, J. B. N. H. S.* xii, p. 266 (1900); *id. Indian Ducks*, p. 227 (1908); *Harington, J. B. N. H. S.* xxi, p. 1088 (1912); *Bell, ibid.* xxii, p. 400 (1913).

Nyroca nyroca, *Oates, Game-B.* ii, p. 318.

Description. Male.—Whole head, neck, and breast rich rufous, or bay-brown, the nape somewhat darker, a dark collar of brownish-black round the neck and thence behind to the back the same colour, a small white spot on the chin; whole upper parts dark blackish-brown or dull black, the feathers of the scapulars and upper back more or less vermiculated with rufous, the vermiculations often almost entirely absent. Wings as in *N. baeri*, but are said, as a rule, to have the white purer; I have, however, specimens of both species quite inseparable in this respect. Lower plumage the same as in *N. baeri* (see p. 273).

Colours of soft parts.—Irides white; bill dull slaty; legs dull, dark slate, tinged either with grey or green, and sometimes mottled about the joints.

“The bill is black, bluish-black and dark leaden, often browner below; the irides white or greyish-white; the legs and toes slate-colour, leaden or dusky-grey; the tarsi often with a greenish tinge; the claws and webs dusky to black.” (*Hume*).

Measurements.—Length about 17 inches, wing 7·1, tail 3·3, tarsus 1·2, bill from front 1·56, from extreme base 1·96, width at front 7·8 and at base 6·4.

“Length 16 to 17·1 inches, expanse 24·5 to 27·3, wing 6·8 to 7·45, tail



THE WHITE-EYED, POCHARD OR WHITE-EYE.
male Nyroca n. nyroca.
 $\frac{1}{3}$ nat. size.
female

from vent 3'1 to 3'5, tarsus 1'1 to 1'3, bill from gape 1'9 to 2'1. Weight 1 lb. 2 ozs. to 1 lb. 9 ozs." (Hume.)

Adult Female.—Similar to the male, but with the whole plumage duller, the head and breast more brown than rufous, and ill-defined from the abdomen, which is itself much sullied, except in very old females.

Colours of soft parts.—Legs, feet, and bill as in the male; irides grey or brownish-grey, sometimes white in very old females.

Measurements.—Length about 16 inches, wing about seven, tail about 3'3, bill generally rather smaller than that of the male, but sometimes reaching the full dimensions given above.

"Length 15'9 to 16'5 inches, expanse 24 to 26'5, wing 6'8 to 7'4, tail from vent 3 to 3'4, tarsus 1 to 1'25, bill from gape 1'9 to 2'5. Weight 1 lb. 3 ozs. to 1 lb. 6 ozs." (Hume.)

Young Male.—Similar to the female, but with the whole head and breast much suffused with ochraceous, and the centre of the abdomen with the broad brown bases to the feathers showing prominently; the back is lighter also than in the old female, with the pale borders to the feathers well-defined.

Scully, quoted by Hume, thus describes two young birds:—

♂ juv., 30th July. "Length 16'1 inches, expanse 21, wing 5'1, tail 2'4, tarsus 1'1, bill from gape 1'75. Weight 15'5 ozs. Bill dusky, livid below; irides dark brown; legs and feet mottled dusky; claws black."

♀ juv., 18th July. "Length 15'7 inches, expanse 26'2, wing 7'5, tail 2'1, tarsus 1'2, bill from gape 1'9. Weight 15'4 ozs. Bill black above, grey-slaty below; irides brownish-grey; legs and toes dusky plumbeous, webs greyish-black; claws black."

Young in first plumage.—"Head and neck brown, with scarcely any chestnut tinge on the sides of the head; breast and under parts brown, paler, almost whitish on the abdomen; under tail-coverts dull whitish." (Salvadori.)

"Young in Down are dark brown on the upper parts, with pale spots on wings and scapulars; under parts buff, shading into brown on the flanks." (Seeböhm.)

Distribution.—Salvadori thus defines the limits of the White-eye:—

"Western Palaearctic region, as far east as the Valley of the Ob; breeds in the basin of the Mediterranean, in Central and Eastern Europe, and in Western Asia as far as Kashmir; in winter it extends in Africa as far south as the Canaries on the west and Abyssinia on the east; in Asia as far south as India and Arrakan."

In India the White-eye is extremely common over the whole of the northern portion, though it becomes less so to the east of longitude 9°, being still found, however, in considerable num-

bers throughout Assam, Manipur, Cachar, Sylhet, Chittagong, and Southern Burma.

As regards the last mentioned, however, some of the records may refer to the Eastern White-eyed Pochard.

As it wanders south, it appears to get more and more rare, but it is not easy to trace its extreme southern limit. To the extreme west, Vidal got it at a place called Khed, in Ratnagiri, about latitude $17^{\circ} 4'$. Mr. P. M. Allen records having shot a pair of White-eyes in the Nizam's territory at Nalgonda, latitude $17^{\circ} 22'$. Then to the east coast, Hume says, "I have failed to trace it; it is not recorded from . . . one of the Madras districts south of Mysore and the town of Madras." This would infer that he has had records of it as far south as Madras; but I cannot find any traces of them. In Burma it has only been recorded as far south as Arakan.

Nidification.—This is one of the very few migratory ducks which breed regularly within our limits. As to its breeding in the plains, Hume writes:—

"The White Eye breeds possibly in some localities in the plains of India, and in Sind, where it swarms during the cold weather, and where I was informed that in some broads it remained during the whole year. I have never, however, succeeded in finding a nest or obtaining any reliable information as to one being found in the plains."

This was written nearly forty years ago, and the reliable information is still wanting; so that it is only fair to presume that the duck does *not* breed in the plains.

In Kashmir it breeds regularly and in very great numbers, so large, indeed, that the collecting of the eggs of this duck and of the mallard, and bringing them into Srinagar by boats for sale, formed a regular and profitable profession with a number of the people living in the vicinity of their breeding-haunts. The practice has now been prohibited, and the ducks are said to be *decreasing* in numbers. The nest is an ordinary structure of fair dimensions, made in the usual duck fashion of reeds, grasses, etc., and is, in India at least, nearly always placed either very close to the water or in the water itself amongst the vegetation growing in the shallows. Inside the nest there are, of course, feathers and down in greater or smaller amounts, frequently not much; but, in addition to this, there appears generally

to be a sort of subsidiary lining composed of grasses and weeds finer than are used in the body of the nest. This characteristic of the nest is rather marked in contrast to the majority of other ducks' nests, but it is well authenticated and worthy of notice.

Where the birds are most numerous, several nests may be found in close proximity to one another; and as the birds are close sitters, finding them is a matter of little difficulty.

In Kashmir the first few birds breed in the end of April, but not many till the beginning of June; and it was in this month that the regular trade in their eggs used to commence. They appear to lay from six to ten eggs, possibly one or two more occasionally; but such occasions cannot be frequent, as Hume's collectors never succeeded in finding more than ten.

In the basin of the Mediterranean they would seem sometimes to place their nests in cover, some little distance from the water, for Lord Lilford, who found its nest in Southern Spain, writes:—

“ We obtained a nest of nine eggs, from which I shot the female bird. The nest was at a short distance from the water, in high rushes, and was composed of dead dry water-plants, flags, etc., and lined with thick brownish-white down and a few white feathers.”

In Eastern Europe, also, it is said to sometimes lay twelve eggs, and I have one record from Turkey of fourteen eggs having been laid in a nest. This nest also, I may add, was placed a considerable distance from water, in amongst bushes. The colour of the egg varies from pale drab to a quite deep *café-au-lait*, the latter colour, if dark, being unusual. In a few eggs there is a faint yellow or greenish tinge; but the greatly predominating tint is a brown or *café-au-lait*, and nine out of ten will be found to be of this colour.

The shape is, as a rule, rather a long oval, very regular, and it varies but little. Hume says:—

“ They are commonly very regular and perfect ovals, moderately broad, as a rule, but occasionally considerably elongated and slightly compressed towards one end.”

In my series I have no eggs thus compressed; all are just about the same at either end. The texture is fine and close, but distinctly more porous than the average duck's egg; and the eggs, in consequence, are very liable to discolouration. The surface is smooth, but has no gloss.

Hume's eggs vary in length between 1.9 and 2.2 inches, and in breadth between 1.4 and 1.54. I have two eggs 2.25 inches long, but in all others both breadth and length come within these extremes; on the other hand, whereas Hume's series average 2.1×1.49 inches, mine average 2.12×1.45 , showing them, as I have already said, to be rather narrower and longer proportionately.

General Habits.—The kind of water preferred by the pochard is that also which forms the favourite resort of the White-eyed Pochard. I have, however, found them in all and any sort of water. Wandering up and down the hill-streams, clear deep pools and rushing torrents of shallow water following one another in rapid succession, I have often disturbed small flocks of the White-eye; and I have equally often found a pair or a small flock in the very dirtiest and smallest pools of stagnant water. It is often found in sea-water, *vide* Sinclair, who says that it is "the sea-duck of the Alibag coast," where they "ride generally just outside the surf, where they are safe from disturbance from passing boats."

Where there are wide stretches of water, clear here and there in patches, but for the most part covered with water-plants, and with shores thickly lined with weeds, &c., the White-eye assembles in vast numbers, but not in very large flocks. These (the flocks) may number anything between half-a-dozen and over fifty, but even of the latter number there will be but few. Then, again, the birds lie so scattered and far apart that they keep rising in ones and twos, giving the impression that they are only consorting in pairs or very small flocks, and of course many single birds and pairs are really met with.

As showing the numbers in which these ducks are found in suitable localities, it is worth notice that, in the 'Asian,' a bag of ducks was recorded as having been shot in Chapra, which contained 385 duck; but out of this no less than 187 were White-eyes. No doubt their manner of rising is a very admirable trait for any duck to possess, and the White-eye has other good points as well. As a rule it is a decidedly tame bird, still lingering in amongst the reeds and other jungle long after nearly all other ducks have left, rising well within shot when disturbed, and often not going far before again seeking the water. It gets off the water badly, fluttering about and

rising very obliquely; nor does it rise high when well on the wing, but generally flies within a few yards of the surface of the water, getting on considerable pace when once fairly away. It requires straight shooting to kill outright, for it is a hardy, close-plumaged little bird, and will take a lot of shot. Hit, but not killed, it is very far from caught, for it is a wonderful diver; quick and strong under water, it makes for the dense undergrowth, where it hides, or if dropped in the open dives for such long periods and goes so far and fast that the gunner never knows where to expect it, and when he may get his second barrel into it. All its good qualities are, however, quite overshadowed by the fact that when shot and caught it is no longer worth anything, for so rank and coarse is the flesh generally, that it is quite uneatable. The condemnation of the White-eye as an article of food is not, however, universal; thus, Colonel Irby speaks of the bird as found in Spain:—

“ Its flesh is not only, like that of the Red-Headed and Red-Crested Pochards, excellent eating, but far surpasses either in that respect.”

Even here, in India, Captain Baldwin once wrote:—

“ It is only a tolerable bird for the table.”

But Mr. F. Finn goes one better than tolerable, and writes in the ‘ Asian’: “ It is said to be very poor eating, but I have found it to be palatable enough.” Tastes differ, however, and there may be others to agree with Messrs. Finn and Baldwin, but personally I have nearly always found it unpalatable in the extreme—fishy, oily, and rank, though on one occasion in Dibrugarh I shot some which turned out really excellent eating.

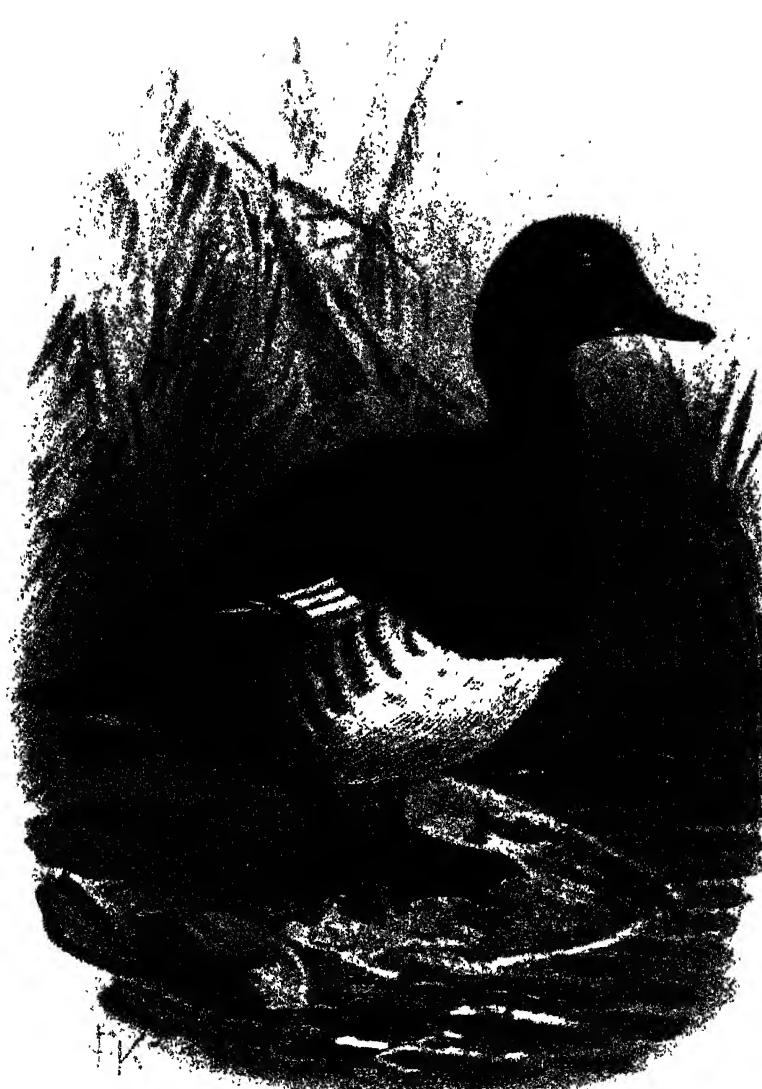
Omnivorous, like all ducks, this species probably makes its diet fully three-quarters animal. Those birds which I shot in the Diyang and other hill-streams had all (in addition to the caddis-grubs, dragon-fly larvæ, and similar articles) swallowed quite a number of small fish, some of them three inches in length. These were all, or nearly all, of the small ‘ Miller’s Thumb ’ species, so common in every hill-stream. Doubtless these, from their sluggish disposition and their ostrich-like habits of hiding their heads under a stone and then resting in fancied security, fell a very easy prey to the active White-eye.

On land, this little pochard is quite out of his element : it can walk all right, and get along well enough for purposes of slow progression, but he is very awkward and shuffling in its movements, and incapable of any appreciable increase in the speed of them under the impulse of fear.

It is, on the whole, a very silent bird. Hume says that :—

“ Their quack or note is peculiar, though something like that of the Pochard, a harsh ‘ koor, kirr, kirr,’ with which one soon becomes acquainted, as they invariably utter it ‘ staccato ’ as they bustle up from the rushes, often within a few yards of the boats.”

It is in reference to this bird, and Captain Baldwin’s note on the frequency he has shot it without any feet—not without one only, but without either—that Hume raises the point as to how their feet have been lost, etc., and says that he himself has killed more than fifty birds thus maimed. Frost-bite he dismisses from the list of probable causes, and in this most of us will join him. But what then, is the cause? Crocodiles would not, as a rule, take a foot at a time; traps are shown to be very unlikely agents; and one is thrown back on the fish theory. This is an extremely likely one; for I have myself known domestic ducks to lose their limbs from the attacks of a huge pike—indeed, when the birds were young and weak, they often lost, not their feet only, but their lives also. Ducklings constantly disappear in this manner. As there are many other fish quite as voracious as the pike in other climates, this would account very reasonably for so many birds losing one or more limbs.



BAERS POCHARD OR EASTERN WHITE-EYE.

Nyroca n. baeri.

$\frac{1}{3}$ nat. size.

(41) NYROCA NYROCA BAERI.

THE EASTERN WHITE-EYE.

Anas nyroca, *Guldenstadt Nov. Comm. Sc. Petropol*, xiv. i, p. 403 (1769),
(South Russia).

Fuligula baeri, *Finn. P. A. S. B.* 1896, p. 61; *id. J. A. S. B.* lxvi, pt. 2,
p. 525; *id. Indian Ducks, Asian*, 1899.

Nyroca baeri, *Salvadori, Cat. B. M.* xxvii, p. 344; *Blanford, Avifauna B. I.* iv, p. 461; *Oates, Game-B.* ii, p. 328; *Stuart Baker, J. B. N. H. S.*, xii, p. 610 (1899); *id. Indian Ducks*, p. 223 (1908); *Hopwood, J. B. N. H. S.* xxi, p. 1221 (1912); *Higgins, ibid.* xxii, p. 399 (1914); *Stevens, ibid.* xxiii, p. 735 (1915); *Higgins, ibid.* xxiv, p. 606 (1916).

Description. **Adult Male.**—A large spot at the angle of the chin pure white; the remainder of the head and neck black, glossed with green; breast rufous-chestnut, that colour merging into the black of the head, but sharply defined from the white of the abdomen and under tail-coverts; the feathers of the vent brownish at the base; flanks rufous-brown; upper parts dark-brown; the scapulars and interscapulars very finely covered with narrow bars of lighter brown; vent and upper tail-coverts brownish-black, a few of the feathers at the sides finely vermiculated with white; tail brown; wing-coverts dark-brown; the outer secondaries white with a broad subterminal black band; quills brown, the inner webs of the primaries greyish-brown; the inner secondaries very dark brown, in good specimens very narrowly margined black on nearly the whole of the outer web and glossed with olive-green.

Colours of soft parts.—“Feet lead-grey, with the joints darker; irides white or pale yellow.” (*Salvadori*.)

Bill dull slate-blue, the basal third, tip, and nail black; irides white; legs and feet greyish-leaden, joints and webs darker.

Measurements.—“Length 18 to 20 inches, wing 8.2 to 9.5, bill from point of forehead 1.75, from extreme base 2.2, from gape 2.1, breadth at base .73, and at broadest part .86, tarsus 1.4.

Adult Female.—Like the male, but the head is blackish-brown unglossed with green, and has the anterior part rufous; the spot on the chin appears to be smaller, and the throat and lower part of the neck are more rufescent and paler; the whole tone of the bird is duller, and the definition between the breast and abdomen is blurred and indistinct, while the abdomen itself appears to be a sullied, not pure, white.

Colours of soft parts.—Irides grey or brown, perhaps white in very old females; bill and feet as in the male, but still duller.

"The eyes of the female are brown, rarely grey or whitish." (*Finn*).

Measurements.—Length about 16 inches, wing about 7·5, tail 2·3, bill from point of forehead 1·7, from extreme base 1·98, from gape 1·9, in breadth 1·61, and at widest part 1·85, tarsus about 1·4.

"The female is smaller than the male, especially about the bill; but females in this species appear to vary in size much more than the males, and, as in the Tufted Pochard, some are much duller and less like the males than others." (*Finn*.)

A young male in my possession has the whole head mottled brown and black, the new black feathers showing the sheen of the usual green gloss; the breast is a queer mixture of dirty yellowish-brown and the deep rufous or bay of the adult bird; the lower abdomen and vent are mixed brown and white.

Another young male exactly answers to the description above given for the female, but that the definition between breast and abdomen is very sharp, and the olive gloss on the wing is highly developed.

Baer's Pochard is the eastern form of the common white-eyed pochard, to which it is very closely allied, yet, as far as fully adult birds are concerned, in the case of which it is very easily distinguishable, it would appear to average a much heavier, bulkier bird; and all the birds in my collection, among them two received through Mr. Finn, have proportionately the bill much larger, both longer and wider. Neither Blanford, Salvadori, nor anyone else, as far as I can gather, seems to have noticed this; but to me, when specimens of the two subspecies lie side by side, this great difference in the bills is what first draws attention.

Of course, my series is a very small one, and it is quite possible that large series might show intermediate sizes in both races.

Distribution.—The range of this duck extends, according to Salvadori, from Kamtschatka to Shanghai and Japan; it descends south in winter into South China and Burma, and less often into India.

Mr. Finn, who has kindly given me *carte blanche* to use his notes, thus sums up the records of its appearance in India:—

"It was apparently obtained in Bengal in 1825, and Blyth certainly got one female in the Calcutta Bazaar in 1842 or 1843, but did not identify it, which is not surprising, seeing that it had not then been recognized as a species. Then, at the end of February, 1896, I got eleven full-plumaged birds, and since then the species has come in greater or less numbers every cold weather. I have got three males and a female this month (the former from a dealer), and saw what was either a small dull female or a hybrid with the common White-eye about the middle of January. We have other birds in plumage intermediate between the two White-eyes, and I therefore now think that 'they' inter-breed."

Mr. Finn does not think that Baer's Pochard has been a common form merely overlooked. Certainly, as he says to me in *epistola*, Baer's Pochard when adult cannot well be mistaken for the Common White-eye. Blyth's bird was a young female, and therefore, of course, very much like a Common White-eye. It may be, therefore, that there was just a temporary, unaccountable rush of this form to India, and that it will again cease to appear.

At the same time it seems probable from Mr. Finn's observations in Calcutta that the Eastern White-eye will prove a regular and not uncommon visitor to the North-eastern parts of India, and, almost equally surely, to Northern Burma. My own collectors on two occasions obtained a young male in Cachar; they seemed to know the bird, and called it the "boro lalbigar," or "Larger White-eye." When questioned they said it was a rare but regular visitor to Cachar, and a more common one in Sylhet, whence they offered to procure me specimens. .

Mr. Oates assumes that the present bird is the common form of White-eye procured in Cachar, Sylhet, Manipur and Burma. This, however, is distinctly not correct as regards the first-mentioned three localities, in which the Eastern or Baer's White-eye is infinitely more rare than the common white-eye. I have myself shot over the districts of Lakhimpur, Tezpur (rarely), Gowhatta, Cachar, and Sylhet, and in all of these it is the Common White-eye which is the typical local form, though from all these districts, except Gowhatta, I have obtained one or more specimens of Baer's bird.

Manipur has been shot over by many keen sportsmen who were also good observers, and in one or two cases good field-ornithologists as well, and I cannot believe that none of these would have noticed Baer's Pochard if it had been in any way common. All specimens sent me from Manipur have been of the western form, and I have no doubt that it is the typical form of that State. It, however, does occur there from time to time, and Higgins has recorded five birds being shot near Imphal, whilst Colonel Campbell also obtained one there in March, 1913.

As regards Burma, I cannot dogmatize, but I should note that when I tried my utmost for three years to get specimens of Baer's Pochard from both North and South Burma, I only succeeded in

getting two or three from the Shan States and one from near Bhamo ; all the others sent me were fine specimens of the Common White-eye. I think the inference to be drawn is that, even in Burma, Baer's Pochard is not the common type, and the only other record so far in Burma is that of Hopwood, who said he saw half-a-dozen, and shot two, in Arakan, and a single bird in the Chindwin.

Nidification.—Seebohm, in his 'Birds of the Japanese Empire,' says that "the Siberian White-Eyed Duck breeds in the valley of the Amoor." This is the only note of its breeding which I can find.

It is probable that in nidification it will differ in no way from the Common White-eye, though we may expect to find its eggs to average somewhat larger, and the single egg in my possession bears this out. It is a very dirty dull-coloured drab, in shape a broad regular ellipse, and it measures 2·91 × 1·51 inches. It has no gloss, and the texture is exactly the same as that of *N. n. nyroca*.

General Habits.—Again indenting on Finn, I quote from the 'Asian':—

"No one seems to have had much opportunity of observing this duck in a wild state, and my own observations have been restricted to captives. It is a better walker than most Pochards, and, I have fancied, hardly so fine a diver. It certainly, judging from the birds in the fine water-aviary in the Alipore Zoological Gardens, rises more easily on the wing, and flies with less effort than other Pochards. I notice that at Alipore our birds can rise well up into the roof and fly round and round like the surface-feeding ducks. The species appears to stand the heat less well than the common white eye, and probably breeds in a higher latitude. I am ashamed to say that, having had more to do with this species than anyone, I do not know how it tastes."

I ate part of the flesh of one of my birds, and it was not at all good, not even good enough to finish.

I remember about 1898-99, Mr. J. Kennedy, then Deputy Commissioner, Cachar, shot a White-eye up in the North Cachar Hills, which attracted my notice from its great weight and very dark glossy head. I was not then specially interested in duck, except when on the table, and put the bird down as an abnormally coloured and very large Common White-eye ; but now I have no doubt that it was a good specimen of the Eastern White-eye.

The bird was one of a flock of about a dozen or less, which we sighted flying up-stream on the River Diyung, a mountain stream consisting of rushing rapids and deep still pools of water in alternation. We followed them up and found the birds in a deep, but very rapid narrow, which in one place widened out and made an eddying pool on either side, in which the ducks were swimming.

On our approach they got up, but Mr. Kennedy fired and knocked one over; it was only winged and fell into the torrent, leading us a pretty dance before we eventually secured it. The great pace of the water seemed to have no appreciable effect on it, either in diving or in swimming, for it dashed backwards and forwards with the greatest ease, kept long under water, and turned and twisted with great agility. At last a snap-shot, as it showed itself for a moment, brought it to hand.

I remember the duck, though it must have been a very fully adult male, had bright yellow irides. The bird was so rank and fishy that we could not stand it on the table.

Two of my collectors (Mahomedans), who had lived all their lives in Cachar and Sylhet, said that this White-eye is a faster, stronger bird on the wing than the Common White-eye, an equally good diver and swimmer, and much more shy and wary.

(42) NYROCA MARILA.

THE SCAUP.

Anas marila, *Linn. Faun. Svec. Ed. ii*, p. 39 (1761) (Lapland).

Fuligula marila, *Jerdon, B. of I. iii*, p. 814; *Hume, S. F. viii*, p. 115; *ibid. Cat. No. 970*; *Hume & Marsh. Game-B. iii*, p. 272; *Hume, S. F. x*, pp. 158, 174; *Stoker, ibid. p. 424*; *Barnes, B. of Bom. p. 413*; *Salvadori, Cat. B. M. xxvii*, p. 355; *Oates, Game-B. ii*, p. 337; *Stuart Baker, J. B. N. H. S., xiii*, p. 2 (1900); *id. Indian Ducks*, p. 234 (1908).

Nyroca marila, *Blanford, Avifauna B. I. iv*, p. 462; *Wall, J. B. N. H. S. xvi*, p. 367.

Description. Adult Male.—“Head, neck, upper part of the breast and of the back black; sides of the head and upper neck glossed with green; rest of the back and scapulars white, narrowly barred with black; rump, upper and under tail-coverts black; lower breast, abdomen, and sides white; the vent somewhat greyish; the sides with black barrings; upper wing-coverts blackish, finely vermiculated with white; secondaries white, forming the speculum, which is bounded below by a blackish band, in some specimens more or less freckled with white; tertials blackish with a green gloss, the larger ones more or less finely dusted with whitish; primaries greyish-brown, from the fourth quill with a whitish area on the inner web, the tips black; the marginal under wing-coverts greyish-brown, dusted with white, the remainder, as well as the axillaries, white; tail blackish; bill and legs light lead-grey, webs and nail of the bill blackish; iris yellow. Total length about 18 inches, wing 9·25, tail 2·9, culmen 1·8, tarsus 1·4.” (*Salvadori*.)

Male. Measurements and colours of soft parts.—“Length 20·0 inches, expanse 32·0, wing 9·0, tail from insertion of feathers 2·75, tarsus 1·42, bill along ridge 2·0. The bill is light greyish-blue or dull lead-colour, with the nail blackish; the iris rich yellow; the edges of the eyelids dusky; the feet pale greyish-blue, darker on the joints; the membranes dusky; the claws black.” (*Macgillivray*.)

Adult Female.—“Forehead, lores, and more or less of the chin white, encircling the base of the bill; rest of head, neck, upper back, and upper breast brown, the last mixed with white and passing into the white of the abdomen, not sharply defined as in the male; back and scapulars vermiculated brown and white, flanks the same but with more white; rump, upper tail-coverts, and tail dusky brown; wings as in the male but duller and browner.” (*Blanford*.)

Measurements.—“Length 18·0 inches, expanse 28·0, wing 8·75, tail 2·5, tarsus 1·33, bill along ridge 1·83.”

Colours of soft parts.—“Bill as in the male, but darker; the feet dull leaden-grey, with the webs dusky.” (*Macgillivray.*)

“Young Male has the white at the base of the bill like the adult female, but it is of a darker and richer colour.” (*Salvador.*)

Hume’s young male had the wing only 7·9 inches; bill straight from base to tip 1·7, and at its greatest width 87.

“The very young female is equally like the young *Nyroca*, but it has the chin, throat, and a portion of the lores white, only a little speckled with rufous-brown (which white is not exhibited in any of my young White-eyes), besides the characteristic bill so much broader than those of young *Nyroca* of the same age and sex.” (Hume.)

The measurements of a young female were: wing 7·1 inches; bill straight from base to tip 1·6, and at its widest part 78.

Young in Down.—“Crown, nape, and upper parts uniform dark olive-brown; throat, sides of the head, and fore part of the neck yellowish-white; a dull greyish band crosses the lower neck, rest of the underparts dull yellowish, the flanks greyish yellow; upper mandible blackish, tooth of the beak yellowish; under mandible yellow.” (Dresser.)

Distribution.—The Scaup is a duck of very northern latitudes, breeding in the Palaearctic and Nearctic Regions in the extreme North of Europe, Asia, and America up to, if not beyond, north-east latitude 70°, in Asia. In the winter it extends south to the basin of the Mediterranean, Southern Russia, and Asia Minor, and Central and South-central Asia, as far south as Northern India, South China, and Japan and Formosa, whilst in America it extends as far south (*vide Salvadori*) as Guatemala. In Africa it does not extend south at all; von Heuglin and, after him, Seebohm record it from Abyssinia; but Salvadori says in the ‘Catalogue’ most emphatically, “not (to my knowledge) reaching Abyssinia.” Even here the southern limits given are rarely attained, large numbers of birds remaining all the winter north of latitude 40°. The Scaup is only a very rare winter visitor to Northern India, and up to the date of the publication of the fourth volume of the ‘Fauna of British India,’ I can find no other record of its occurrence outside those noted by Blanford, viz. :—

“Isolated occurrences have been recorded from Kashmir, Kulu and Nepal in the Himalayas, and the neighbourhood of Attock, Gurgaon near Delhi, and Karachi in the plains of India, and even Bombay.”

The last was recorded in the 'Bombay Natural History Society's Journal,' by Mr. J. D. Inverarity, who shot a female on a small tank near Panwell on January 13th, 1884.

"Colonel McMaster is of the opinion that one year, in January, he saw several birds of this species, on marshes and salt lakes, between Chicacole and Berhampur, in the Northern Circars (say 190° N. lat.), and the male is a bird that so experienced a sportsman could hardly mistake for any other species that occurs there."

I do not know if Colonel McMaster said that they were *adult* birds that he saw, if so, perhaps—probably in fact—he was not mistaken; but if they were the common form of young bird usually found in India, he might very well indeed have been mistaken. It was an unlikely thing, too, that he should have seen *several* birds when they are of such rare occurrence. On the other hand, I think there is no doubt that a great many young birds are yearly missed owing to these being mistaken for young pochards of other kinds.

In addition to those already recorded, I have had the following pass through my hands: A fine adult male, procured in the Calcutta bazaar in 1907, but *where* it was taken the dealer could not tell me. A young female sent me as a specimen of the eastern white-eye, from Chittagong, and shot on the coast. A young female shot by Mr. Moore in Lakhimpur in January, 1904. Finally, two specimens shot by myself in the same district, one in March, 1902, and one in November, 1903. On the former occasion the bird was a single one in company with a flight of crested pochards; on the second occasion there was a flock of about a dozen birds, but after I had shot one and missed another as they were driven overhead, I never saw them again.

Captain Wall has recorded the Scaup from Oudh, and quotes abstracts from the Sporting Diary of the Rev. J. Gompertz, which shows that gentleman to have shot no less than eleven specimens between 1897 and 1904 inclusive, all in Oudh.

Possibly the most likely place for this bird to be met with in India would be the coast about the Gulf of Cutch, and north to Karachi, as the Scaup, by preference, is a sea bird. Such as are met with in India are doubtless "moving on" in hopes of getting to some coast eventually. Even in China they wander further south

along the coast, and are far more commonly met with there than they are inland. When they are met with inland it will be generally found that they keep to great lakes, such as Lake Baikal, Lake Balkast and the Sea of Ural, etc.; in these vast extents of water they can live, according to their wont, on the water altogether, taking neither to land nor air, except in cases of emergency, and spending their time diving for food or resting asleep on it just as they would on the sea itself.

Nidification.—The Scaup is one of the most northerly breeding of ducks, having been observed breeding, as already noted, at least as far north as lat. 70° . As to its breeding within Indian limits, this, in spite of Hume's young bird being caught in Kashmir, is most unlikely ever to be found to be the case.

The description of the nest, as given by various writers, differs greatly: one says it is a scanty affair of grasses and weeds, etc., without any down in it at all—a rare thing this with ducks' nests; whilst others say that the nest, though of few materials and very roughly formed, is yet well lined with down and feathers, not only enough to form the lining itself, but sufficient to make a bed in which the eggs lie quite covered,

Its position also seems to vary very much. As a rule, it is placed close to water in a depression under cover of some sort, or else in amongst fairly dense vegetation; at other times—this, it appears, but rarely—in a hole in the ground, and sometimes in the open amongst stones, where there is no cover. In the latter case, no doubt, it is in the bleaker parts, where vegetation close to water is scant, and where, also, there is not much to interfere with the birds' breeding arrangements. According to Dresser:—

“ Not unfrequently several females deposit their eggs in the same nest; and Dr. Krüper states that in Iceland he once found twenty-two eggs in one nest. The eggs are deposited from the early part of June to the middle of July, and when the female commences to incubate she sits very close, not leaving the nest until the intruder is close to it. I possess a nest and seven eggs of this duck, taken by Mr. Meves, in Oland, on the 5th July, 1871. This nest consists only of grass, without any down as lining, and the eggs are uniform greyish stone-buff in colour, and vary in size from 2.45×1.67 to 2.5×1.77 inches.”

The only eggs I have ever seen were taken in Iceland on the 10th June; these are dull *café-au-lait*, with a grey tinge. In shape they are rather broad, very regular ovals, and the texture of the egg is much like that of the egg of *Nyroca nyroca*, but not, I think, quite so soft or porous. There is no gloss.

Dr. Paul Leverkühn informs me that Mr. Baer, of Neisse, in Silesia, found the Scaup breeding in Germany. Previously it had only been known to visit Germany in winter. Dr. Leverkühn himself obtained many specimens on the coast of the Baltic Sea.

General Habits.—Although, once well away on the wing, the flight of Scaup is fairly fast and strong, they are exceedingly slow and clumsy in getting off the water, their manner of so doing having been likened by various observers to that of the coot; that is to say, they rise very obliquely, splashing noisily along the surface for some yards before getting clear of it, and, once clear, still taking some time to get up their speed. When driven, however, from a long distance, enabling them to get fully into their stride, I found that they can work up a very creditable pace, indeed they quite deceived me, my first shot at driven birds being a yard behind, and even the second, which brought down a bird, was not enough forward.

On land they are perhaps, even more awkward in commencing to fly than on the water, and it must be, indeed, severe pressure which can induce them to change their slow waddle into a quicker shuffle. They have the repute of not being wild birds, and of being fairly easy of approach on the water, and, when hard pressed, of frequently preferring to attempt escape by diving rather than by taking flight. So great, however, are their diving powers that they are perhaps as difficult to bring to bag as are the wilder birds which more quickly take to wing. Wounded only, it is as likely as not the bird may escape, as it is almost impossible to follow its movements, and when it does appear on the surface, it again disappears with such rapidity that it takes a gunner of some smartness to get a shot at it and finish it off.

The food of the Scaup is everywhere chiefly of an animal character. Inland, doubtless, it feeds to a certain extent on water-weeds, &c., these being mainly such as grow at some depth and are obtained by

diving; but even here shell-fish, frogs, insects, and small fish, form the greater part of its diet. When in its natural element, on the sea, in creeks, estuaries, or along the coast, it is almost entirely an animal-feeder, subsisting on shell-fish, fish, and other marine life.

Its name is derived from its habit of feeding on mussels, the beds on which the masses of shell-fish lie being known as mussel-scaups, or mussel-scalps (Blanford and Newton), and in Norfolk I have heard both fresh and salt-water mussels called sculps, though the term is usually applied more to the latter than to the former. Hume, quoting Montague, says that:—

“ Both the male and the female have a peculiar habit of tossing up their heads and opening their bills, which in spring is continued for a considerable time, while they are swimming and sporting on the water, and they emit a grunting sort of cry.”

The voice of the Scaup is thus described by Seeböhm:—

“ Of all the cries of the ducks that have come under my notice, I think that of the Scaup is the most discordant. None of them are very musical, perhaps; but if you imagine a man with an exceptionally harsh, hoarse voice screaming out the word *scaup* at the top of his voice, some idea of the note of this duck may be formed. It is said that when this harsh note is uttered the opening of the bill is accompanied with a peculiar toss of the head. The ordinary alarm-note during flight is a grating sound like that made by the Tufted Duck.”

Its flesh, as might be expected, is quite unfit, as a rule, for the table, and the most flattering terms I have known applied to it are Macgillivray’s to the effect that “ it is not thought much of for the table, its flesh being rather rank.”

(43) NYROCA FULIGULA.

THE CRESTED POCHARD OR TUFTED POCHARD.

Anas fuligula, Linn. S. N. x. ed. i, p. 128 (1758) (Sweden).

Fuligula cristata, Jerdon, B. of I. iii, p. 815; Butler, S. F. iv, p. 31; id. ibid. v, p. 234; Ball, ibid. vii, p. 232; Hume, ibid. p. 496; id. Cat. No. 971; Hume & Marsh. Game-B. iii, p. 277; Hume, S. F. viii, p. 115; Vidal, ibid. ix, p. 93; Butler, ibid. p. 439; Reid, ibid. x, p. 85; Davidson, ibid. p. 326; Barnes, B. of Bon. p. 414; Hume, S. F. xi, p. 347.

Fulix cristata, Hume, S. F. i, p. 265; Davids. & Wend. ibid. vii, p. 93.

Fuligula fuligula, Salvadori, Cat. B. M. xxvii, p. 363; Oates, Game-B. ii, p. 348; Stuart Baker, J. B. N. H. S., xiii, p. 6 (1900); id. Indian Ducks, p. 239 (1908).

Nyroca fuligula, Blanford, Avis fauna B. I. iv, p. 463; Hopwood, J. B. N. H. S. xviii, p. 433 (1908); Harrington, ibid. xix, p. 379 (1910); Bell, ibid. xxii, p. 400 (1913).

Description. Adult Male.—Whole head, neck, back, rump, tail, breast, wing-coverts, under tail-coverts, and innermost flanks black. On the head there is a certain amount of green gloss on the sides, and the crest and nape have purple reflections; the back, scapulars, and more or less of the wing-coverts have a very fine powdering of white, so fine as to often require careful looking for before being found, and never enough to have any influence on the prevailing tint; primaries dark brown, the inner web of the first whitish at the base, fading into brown elsewhere, the white on each quill increasing in extent until, on the innermost, only the terminal half-inch is dark. In all the quills the definition between white and brown is gradual, not abrupt, the two colours gradually blending; outer secondaries white with black tips; inner secondaries black, glossed with green. Abdomen white, sharply defined from the breast, but more or less mottled near the black flanks. Irides bright yellow; bill deep slate, tipped black; legs dull lead-colour.

Measurements.—Length about 17 inches, tail 2·1 to 3·0, wing 7·6 to 8·5, tarsus 1·5; bill straight from front to tip 1·52 to 1·75, at widest point 0·86 to 0·90, and at narrowest 0·65 to 0·70; crest from 1·75 to 2·72.

Males.—“Length 16·6 to 17·2 inches, expanse 27·5 to 30·3, wing 7·8 to 8·5, tail from vent 2·5 to 3·25, tarsus 1·3 to 1·4, bill from gape 1·85 to 2·0. Weight 1 lb. 8 ozs. to 2 lbs. $\frac{1}{2}$ oz.”

Colours of soft parts.—“In adults the bills vary from dull leaden to



THE CRESTED POCHARD OR TUFTED POCHARD.

Nyroca fuligula.

$\frac{1}{3}$ nat. size.

male.

female.

light greyish-blue, the nail and extreme tip being black; the irides are golden yellow; the legs and feet vary like the bill; there is often an olivaceous tinge, especially on the tarsus, the joints have usually a dusky tinge, the webs vary from dusky to almost black, and the claws from deep brown to black." (*Hume.*)

Adult Female.—Similar to the male, but has the black replaced by brown, and the definition between the brown breast and the abdomen very much blurred and mottled. A bird sent me from the Indian Museum, Calcutta, has the whole of the lower parts rufescent, and they are mottled everywhere with pale-brown, except on the very centre of the abdomen.

Colours of soft parts.—The colours of the soft parts are the same as in the male, but generally duller.

Measurements.—“Length 15·2 to 16·75 inches, expanse 26·7 to 28·7, wing 7·6 to 8·0, tail from vent 2·6 to 3·0, tarsus 1·2 to 1·4, bill from gape 1·81 to 2·0. Weight 1 lb. 5 ozs. to 1 lb. 12 ozs.” (*Hume.*)

Crest about 1 to nearly 2 inches, rarely more than 1·5.

A very fine young male in my collection is like the adult, but has the breast colour weakly defined, has no gloss on the head, and has a white face extending back fully half an inch from the base of the upper mandible. In this bird the white feathers of the outer secondaries have black shafts, and have also a narrow black margin to the outer webs.

“Young in first plumage.—Closely resemble the adult females, but are paler brown, especially on the chin and throat, and have no metallic-green gloss on the innermost secondaries; there are many white feathers at the base of the bill.

“Males in post-nuptial dress have white margins to the black feathers of the breast, a shorter crest, no green or purple gloss on the head, and a small white spot on the chin.” (*Salvadori.*)

“Males in moulting plumage are intermediate in colour between males in first plumage and males in post-nuptial plumage.

“Young in down are dark brown, shading into nearly white on the belly.” (*Seeböhm.*)

Distribution.—*Salvadori* thus defines the habitat of the Tufted Pochard:—

“Palaearctic region from the Atlantic to the Pacific; in the Ethiopian region it extends as far south as Shoa, and apparently breeds in the high lakes of Abyssinia; in winter in South China, Japan, and India, but not in Ceylon or Burma; accidental in the Malay Archipelago (Philippines and Borneo), and in the Polynesian Islands (Marianne Island and Pelew Islands).”

As regards its distribution in India, *Hume* gives very full details. He writes:—

"Very rarely seen in the Himalayas, the Tufted Pochard is somewhat thinly distributed in the cold season in the Punjab and the Doab, is scarce in Rajpootana, more common in Rohilkhand and Oudh, and less so in the Central Provinces and Bundelkhand.

"In Sind it is not very abundant; in Cutch more; in Kathiawar and Gujerat, in the Central Indian agency, Khandesh, and the Deccan fairly common.

"In Bengal, Cis-Brahmapootra, it has been noted from many districts, but I believe it to be rather scarce there, though my information on the subject is scant. Damant records it, and some of Godwin-Austen's people procured it from Manipur; but I have no information of its occurrence east of Brahmapootra, whether in Assam, Cachar, Sylhet, Tipperah, Chittagong, or any portion of British Burma; I do not doubt that it straggles into many of these, but the fact has yet to be ascertained.

"It occurs in places in very large flocks in Chota Nagpur, the Northern Circars, and the Nizam's dominions, straggling by the way at times into Southern Konkan. It has been shot at Bellary, and certainly, though rare there, visits Mysore; but south of this I have heard of it nowhere in the Peninsula, except in the north of the Coimbatore district, nor has it yet been recorded from Ceylon. Here, too, however, our information is very imperfect, and stragglers will probably turn up in many districts where the species has not yet been noticed."

Then in a footnote he says:—

"This species has not been recorded from Kashmir."

In 1906, however, in the 'Asian,' in the same bag as that to which I referred in a previous chapter as having been obtained by A. E. W. in Kashmir, two Tufted Ducks are recorded as having formed part of the bag. There can be little doubt that it occurs constantly, but not in large numbers, in that State. It is not common, but at the same time may be met with fairly regularly, throughout Assam, Cachar, Sylhet, and Chittagong; Mr. R. S. Routh, Superintendent of the Hill Section of the A.-B. Ry., shot two fine specimens on 21st November, 1898, on a large tank in the station of Haflong, North Cachar; and I have an immature male in my collection, shot by one of my men in Cachar, as well as two young females. I have it recorded from Sylhet, and it is the most common of all the pochards in Lakhimpur. It was plentiful at Dimagi and Sissi, and I saw it in all the rivers, the Subanrika and smaller streams, about Patalipam and North Lakhimpur, its

very black plumage making it very easily distinguishable. Recently it has been recorded as having been shot in Burma, near Mandalay, and it is also recorded from Bhamo, Arakan, and the Chindwin by Hopwood and Harington. Oates, in 'Game-Birds,' records that out of the bag of 562 ducks already referred to as having been shot by Capt. Johnson and party, no less than 122 were of this species; Major Rippon also informed him that this duck was to be found all over the Shan States, though Oates himself did not meet with it anywhere in Lower Burma. It will doubtless prove to occur plentifully throughout the northern part at least of that province, and probably in small numbers, as far south as the north of Tenasserim.

Nidification.—The Tufted Duck breeds, as far as we know, throughout the northern portion of its range, and in some parts very far south. Thus it is known with comparative certainty to breed in some of the upland lakes of Abyssinia, in Southern Europe in many countries, and in Central Asia. The nest is typically rather a slight affair, made more of grass and bents, and less often of reeds, rushes and water-plants, than are most ducks' nests. The lining, which is generally very plentiful, is said by Dresser to be of "sooty brownish-black down, having all greyish-white centres." The nest may be placed either close to the water or actually at the edge, never, as far as I can learn from anything recorded, actually in the water itself. The water may be either fresh or salt, an inland lake far from the shore, or an estuary or creek of the sea itself; as a rule, the nest is placed amongst either grass or bushes, but sometimes quite out in the open, amongst stones, etc. This sort of situation is not, however, it would seem, as often selected by the Tufted Duck as it is by the Scaup, nor can I find any mention of its placing its nest in holes as does the latter bird.

Dr. Leverkühn sends me an interesting note on the breeding of this duck. He says (*in epistola*) :—

"*Fuligula fuligula* is a very common bird on the great lakes of Hungary, Slavonia, Germany, and Bulgaria, and I have taken many of its nests during the month of May. The duck, when frightened and leaving its nest, covers the eggs with all the contents—which there may be at the moment—of her intestinal tractus; for the oologist it is hard work to clean them afterwards.

"One nest I found was covered in, in a very beautiful manner,

by tips of the grass surrounding the nesting-place; one would have said that this particular duck had known the art of sewing, so finely had she joined the grass-helms together, probably with her bill."

Most naturalists note that the eggs vary from six to ten in number, less, therefore, than in many other ducks' clutches; but Seebohm says, "the number of eggs is usually ten or twelve, but sometimes only eight are laid, and occasionally as many as thirteen." Dresser describes the eggs as uniform pale olive-green, or greenish-buff in colour, smooth and polished in texture of shell, and in size averaging about $2\cdot3 \times 1\cdot65$ inches. Wolley's egg, figured by Hewitson, is of exactly the same size.

Morris figures the egg as like that of the Scaup, but longer and proportionately narrower. In colour it is rather a bright pale buff.

As regards the breeding he says:—

"These birds breed along the stony shores of the sides of the inland waters, among the cover of vegetation, more or less thick, with which they are usually bordered.

"The receptacle for the eggs—for it can hardly be called a nest—is composed of stalks and grasses.

"The eggs vary in number from eight to ten. They are of a pale buff colour with a tinge of green.

"The male bird leaves the female after she has begun to sit."

Oates records the measurements as being between $2\cdot15$ and $2\cdot4$ inches in length, and $1\cdot55$ and $1\cdot65$ in breadth.

My own eggs varied a good deal more than these, as my largest is $2\cdot46 \times 1\cdot68$ inches, and my smallest $2\cdot15 \times 1\cdot50$.

Finn's remarks on the cross-breeding of this bird is worth noting and remembering by sportsmen who get hold of birds beyond their power to discriminate:—

"It breeds more freely in captivity than do Pochards in general, and in the London Zoological Gardens crossed in 1849 with the White-eye, the resulting hybrids continuing to breed either *inter se* or with the original parents for more than ten years, a fact to be remembered in dealing with doubtful Pochards, which should therefore, whenever possible, be submitted to some authority for identification."

General Habits.—This Pochard is one that essentially requires open water, and in preference resorts to wide expanses of water some considerable depth in the centre, though more or less weed

and rush overgrown round the shores. Where such pieces of water are to be found, the Tufted Pochard may be obtained in no inconsiderable numbers; at the same time it is unusual to find it in any but small parties and pairs, and single birds are more often to be met with than even such. Sometimes, however, it does consort in very large numbers, *vide* Hume, who says:—

“ Single birds or small parties may be found on almost any broads in which the water is tolerably deep in some places, but the huge flocks in which they love to congregate are only met with on large lakes, just as I have above referred to.

“ At the Manchar Lake I saw two enormous flocks. I have repeatedly seen similar flocks in old times at Najjafgarh and other vast jhils in the Punjab, the North-west Provinces, and Oudh; and I should guess that at the Kunkrowli Lake, in Oodeypore, there must have been nearly ten thousand, covering the whole centre of the lake.”

Such flocks as these are, however, only to be met with in the provinces mentioned; in the Eastern Provinces a flock of forty is very large, and about all we may expect to meet with.

Just as expert as are the rest of the pochards on or in the water, it excels the majority of these—perhaps not *N. baeri*—in getting away from it. It rises with less fluster, noise, and splashing than is caused by the rising of other pochards, and also gets off the water more quickly and gets more quickly into its stride, if I may use such an expression. Indeed, when frightened, it flies at a great pace, nearly equalling the pintail, and exceeding most other ducks. On land, however, feeble as are other pochards, this, according to Finn, is worse still. He says, in the ‘Asian’:—

“ On land it moves more awkwardly than any other Pochard I know, hobbling as if lame in both feet.”

However abundant it may be, the Tufted Pochard does not, as a rule, form a very large portion of a bag in a day’s shooting. This is due to the difficulty, first, in approaching the birds—for they are decidedly wild and shy—and, secondly, in getting a shot when once one has got within reach. If the bird does not escape at once by diving, swimming, or flight, it is sure to dive before, at any rate, the sportsman has time to get a shot, and once it has seen him and had its first dive it is very problematical as to whether he will ever get a

shot again. It is worth remembering, should one come across a flock in any large piece of water, Hume's maxim that Tufted Pochards will not leave the water they are on until after dark. He gives one of his usual graphic descriptions of a shoot in which Tufted Pochards played the principal part, and describes how, after a fusillade from ten guns, no more than five (!) birds were collected out of a huge flock of ducks diving all round about them.

Knowing their habits, however, he waited until he and his fellow-sportsmen were going over the same beat the next day, and then, extending in a long line, they worked backwards and forwards, and this time the birds rising in front were at each beat gradually forced to the end of the water. After arriving at this they had to fly back overhead, and in this way they were accounted for to the tune of over sixty ducks.

They are not to be often found on open tanks, whose shores are free of jungle, nor on rivers; but I have once or twice seen pairs on the Megna, and at other times have met with them on tanks absolutely free of all vegetation. The pair shot by Mr. Routh in Haflong were on an artificial tank with no vestige of water-plants about it, as it had not been a year in existence. I found also that when leaving and entering India, and during the months of March and early April and in October, these little ducks were quite common on all the hill streams and rivers where they debouch into the plains.

Their cry is the typical, harsh '*kir*' or '*kurr*,' of the Pochard family; but they are silent birds on the whole, and seldom indulge in vociferations of any sort.

This duck's food is almost entirely animal, much the same, in fact, as that of the scaup, but it is far more a fresh-water bird, and far less a sea-bird, than is that duck, though common enough on the coastline along the greater part of its habitat. It is, of course, a poor article of food, though here, again, tastes differ, and some people say it is not bad. Hume, who was particular about his table ducks, said that he had found some "good enough," and that some sportsmen had told him that they were excellent!

Tufted ducks feed principally during the daytime, but migrate and move from one place to another after sunset. They do not ever appear to have been found feeding on land, but should they ever do so, the probability is that they only thus feed during the night.

Genus GLAUCIONETTA.

The genus *Glauclionetta* is a very small one, containing only three species of birds which range throughout the Northern Hemisphere. Of these three, only one, *Glauclionetta clangula*, reaches India, and even this only occurs with extreme rarity. The most noticeable thing in this genus, and one which at once separates it from all its closest allies, is the position of the nostrils, which are rather nearer the tip than the base of the bill, the position being well shown in the woodcut in Blanford's fourth volume of the 'Fauna of British India.' In many respects in its anatomy it closely approaches the Mergansers, and it is a sort of link between them and the more typical ducks.

As the generic term *Clangula* cannot be used, the correct name appears to be Stegner's name *Glauclionetta*, and not *Bucephalus*.

(44) GLAUCIONETTA CLANGULA.

THE GOLDEN-EYE.

Anas glaucion, Linn. S. N. x. ed. p. 126 (1758) (Sweden).

Clangula glaucion, Hume, S. F. iv, p. 225; *id. ibid.* vii, pp. 441, 464 and 505; *id. Cat.* No. 961, bis; Hume & Marsh. Game-B. iii, p. 185; Reid, S. F. x, p. 85; Stoker, *ibid.* p. 424; Barnes, B. of Bom. p. 413; Salvadori, Cat. B. M. xxvii, p. 376; Blanford, Avifauna B. I. iv, p. 464; Stuart Baker, J. B. N. H. S. xiii, p. 13 (1900); Yerbury, *ibid.* p. 533; Macdonald, *ibid.* p. 700; Stuart Baker, *ibid.* xv, p. 348; *id. Indian Ducks*, p. 246 (1908). Osmaston, J. B. N. H. S. xxii, p. 549 (1913); Delmé-Radcliffe, *ibid.* xxiv, p. 169 (1915).

Clangula clangula, Oates, Game-B. ii, p. 358.

Bucephalus clangula clangula, Hartert, Vog. Pal. p. 1346 (1920).

Description. Adult Male.—“Head and upper neck dark glossy-green, the feathers on the crown and nape somewhat elongated; chin and throat black; a roundish white patch on the cheeks near the base of the upper mandible; lower neck, breast, and under parts white; on the sides of the vent the feathers have the bases slaty-grey showing through; feathers of the flanks edged above with black, the longer ones on both webs; back, rump, and upper tail-coverts black; inner scapulars black, the outer ones white, longer scapulars with a white band about the middle; wings black, with a large white patch covering the central wing-coverts and the outer secondaries; the inner secondaries black; under wing-coverts greyish-black; tail blackish-grey; bill bluish-black; irides golden-yellow; feet orange-yellow; the webs dusky.

Colours of soft parts.—“Bill black in the male the eyes are yellow and the feet yellow with black webs.” (F. Finn.)

“The irides are bright yellow in the females and young males, reddish or orange-yellow in old males, white or very pale yellow in the quite young birds. The naked edges of the eyelids reddish-dusky; the legs and feet vary from pale yellow in the young to intense orange in the old; the colour is always bright and pure; the webs (including that of hind-toe), nails, and a spot on each of the toe-joints, black or dusky. The bill of the old male is bluish or greenish-black, rather duskier and duller coloured in the old females and young, and occasionally in these latter, often in the former, and very rarely in the old males, with a larger or smaller yellowish-red or orange spot or bar near the tip of the upper mandible, which in some forms the terminal band at the tips of *both* mandibles, never, however, including the nail, which always remains black or dusky.” (Hume.)

Measurements.—“Total length about 18 inches, wing 8·9, tail 4, culmen 1·4, tarsus 1·45.” (Salvadori.)

Female.—“Head and upper neck hair-brown; a dull white collar round the lower neck; upper parts blackish; mantle, scapulars, and upper wing-coverts with pale greyish edges; breast greyish, with the edges of the feathers whitish; lower parts white; sides and flanks dull grey, the feathers edged with white; median wing-coverts brown tipped with whitish, the greater ones white tipped with brown; outer secondaries white; the white on the wing is defined by the brown band at the tip of the greater coverts; quills dusky brown; tail dull greyish; bill brownish-black, in some specimens the tip, except the nail, is yellow; irides and legs and toes as in the male. Total length 17 inches, wing 7·7, culmen 1·35.” (Salvadori.)

Colours of soft parts.—“The bill is blackish in the female and young, sometimes with a yellow patch at the tip.” (F. Finn.)

Measurements. Females.—“Length 15·7 to 16·5 inches, expanse 26·3 to 28, wing 7·5 to 8·25; tail from vent 3·0 to 3·4, tarsus 1·22 to 1·35, bill from gape 1·12 to 1·19. Weight 1 lb. 7 ozs. to 1 lb. 14 ozs.” (Hume.)

Young in first plumage resemble adult females, but are duller in colour; the pale collar round the neck is much more obscure and the grey feathers on the breast have white margins.

"Males in first nuptial dress have less white on the scapulars, the white on the hind lower neck is mottled with brown, as is also the white spot at the base of the bill.

Males in moulting plumage resemble adult females, except that they retain the white wing of the adult male.

"Young in Down are dark brown on the upper parts, and paler brown on the breast and flanks, shading into white on the throat and into pale grey on the belly." (Salvadori.)

Distribution.—This is a northern form of duck, breeding in Northern Europe and Asia. In winter it migrates to Southern Europe, and rarely only into extreme North Africa. In Asia it occurs as far south as Persia, China, and Japan, and as a straggler enters Northern India and Southern China. The American form is separated from our bird under the name of *G. c. americana*. The occurrence of the Golden-eye in India, as I have already said, is only as a straggler, and a very rare one too; all the notes as to its occurrence in 'Game-birds' are that Sir A. Barnes got it on the Indus in Sind nearly sixty years ago, and that Dr. Bonavia obtained a fine male about 1870, which was captured by fowlers near Lucknow.

After 'Game-Birds' was written, Hume evidently got other specimens, for in the British Museum are two specimens got by R. N. Stoker, which were presented by Hume with the rest of his collection. These two birds were obtained, one at Hassanpur, and one at Ghazi, both in the month of December. There is so little on record about this duck in India, and 'Stray Feathers' is now so hard to get, that I reproduce the greater part of Stoker's notes on his specimen.

"I have now to record shooting near Ghazi, on the Indus, a female Golden Eye (*Clangula glaucion*). I saw one drake and four ducks, but unfortunately only succeeded in getting one of the latter.

"This measured: length 15'75 inches, expanse 26'5, tail 3'66, bill from gape 1'66. Weight 1 lb. 5 ozs.

"The irides were a bright pale-yellow; the feet bright yellowish-orange, with dark blackish webs; bill black at base and tip, with a medial yellow band about 0'25 mm. in width."

In the same letter, in a P.S., he continues:—

"Since this was written I have shot another Golden Eye, a bird of the year. . . . A third bird, precisely like this second, was shot by an officer here, but hitherto the drake has resisted all our attempts to assassinate him.

"I showed the first bird to a very intelligent native at Ghazi, and he assured me that they appeared there every year regularly, and that three years ago he shot one. I am certain that I shot a duck of this species some three years ago. It puzzled me at the time, but now I have no doubt what it was."

Then, in a second letter, Mr. Stoker again writes:—

"Since I last wrote, I have succeeded in obtaining a fine drake Golden Eye, which I am sending you.

"There were four of them together in a little stream opposite the village of Hassanpur.

"The natives called them 'Burgee,' the 'bur' pronounced as in burrow. Burgee, I believe, only means patches of black and white.

"Mr. Barlow informs me that these ducks come to Ghazi every winter.

"This drake measures: wing 9·0 inches

"We all said what a heavy bird, but it only weighed 1 lb. 10 ozs., which is 6 ozs. less than the lightest weight given by Hume for an adult male.

" The stomach contained fish, weeds, and sand.

"With this drake was procured a female similar to those formerly sent. It was wounded, and was put in a cage, and unfortunately was allowed to escape.

"We may now set down the Garrot or Golden Eye as a regular winter visitant to the Punjab portion, at any rate, of the Indus, and as Barnes procured it near the mouth of the Indus, it most probably occurs throughout the length of that river. But can it be confined to the Indus? Surely, if properly looked for, it will be discovered in the Chenab and other Punjab rivers. Is it purely a river duck with us, or will it also occur in jheels? Other sportsmen in the Punjab must help us to settle these questions.

"P.S. My last Golden Eye is a young female, weight 1 lb. 3 ozs., it was seen with a *number* of others on a little pool. There were no other ducks about."

Thus Stoker seems to have got no less than five specimens, and a sixth was got by an officer whom he does not name. Barnes got one other, and these are all that had hitherto been recorded; but in consequence of my noting in the original article on this duck in the B.N.H.S. Journal to the following effect:—

"None have been since met with, so that it looks as if Stoker's queries as to its regular appearance must be answered in the negative."

Colonel Yerbury wrote to the Journal (*in loc. cit.*) as follows:—

“ In the Chack Plains, on the banks of the Indus above Attock, the Golden Eye is a regular, and by no means rare cold weather visitant.

“ On referring to my old Shikar diary, I find the following records regarding it:—

- I. Azgar, 26th December, '85 (2 spec. ♀ ♀).
- II. Azgar, 27th December, '85 (1 do. ♂ immature).
- III. Azgar, 8th February, '86 (2 do. unsexed).
- IV. River Indus between Attock and Azgar, 24th February, '86 (1 spec. unsexed).

“ On the latter date I was in company with Dr. Stoker, and we shot up-stream from Attock along the banks of the river to Gaziabad, returning the next day to Attock by boat.

“ I can find no records of shooting any specimens during the cold weather of 1886-87, but I think this was probably due to my having refrained from shooting them, the duck being useless for the table.

“ A brief description of the locality affected by the species may be of interest. The River Indus, after having been much narrowed above Torbela, by the near approach of the mountains on each side, widens out at the Chack Plain to a considerable breadth (possibly six or seven miles in places), to be again constricted at Attock. In the Chack Plain, where the river is widest, there are numerous islands in the bed of the stream, and it is in the channel between the islands and the banks of the river that the Golden Eye lies. A similar widening of the river takes place below, further south, below Kalabagh, and there, probably too, the species will turn up.

“ I never met with this species away from the river, and, like Dr. Stoker, generally found it in flocks of four or five individuals The most interesting piece of information given me by my informants was the short period they considered the species to be away from the neighbourhood ; they said it was absent only during three months—April, May and June—but I had no opportunity of verifying this statement.”

In 1903, on the 25th April, Mr. Morton Eden sent me a duck to identify, which had been shot by him in Sadiya, Lakhimpur district. With this skin he sent the accompanying note:—

“ I think it is a Golden-eye it is not a rare bird above Sampura.”

In answer to a letter from me, Mr. Morton Eden then sent me the following interesting account of what he had observed:—

"I shot this bird on the 3rd February last, a few miles above Sampura. I was coming down-stream at the time, when the bird, which was by itself, got up a long way down and flew up-stream, passing my boat at a distance of some fifty yards, and I fired at and dropped it.

"Above Sampura, and up to and beyond Sidharoo, the Golden-eye is not at all uncommon, and I must have seen a hundred or more last January and February. They occur either singly, or in small flocks of eight to ten birds; they are wild, and will not let a boat come anywhere near them, but rise 100 to 150 yards off, and generally make a fairly long flight before again settling.

"They always flew off when disturbed, and I never saw them try to escape by diving.

"In the early morning I saw them on several occasions flighting with Mergansers; their flight is rapid and much like that of the Tufted Pochard, but not quite, I think, so rapid as that of the White-eyed Pochard.

"I may mention that I shot a Golden-eye about ten miles from here (Sibsagar) in the cold weather of 1885-6. I sent the skin down to Calcutta, and I think they now have it in the Indian Museum."

The rivers mentioned by Mr. Morton Eden in the earlier part of his notes are in the Sadiya subdivision of Lakhimpur, and are practically hill-rivers of rapid-running clear water. They are of considerable size, even where they just debouch from the mountains, and are the haunts of Golden-eyes, Mergansers, Ibis-bills, and probably many other rare water-birds.

I have, since Mr. Morton Eden sent me his notes, seen the Golden-eye on several of the hill-streams in the same district. Upon the Subansiri, a magnificent stream of deep still pools and madly-running rapids, I saw this little duck nearly every time I visited it in the cold-weather months, and what I saw fully agreed with his remarks. Only on one occasion did I get really near to it, and this was once when I was stalking a bull buffalo. The buffalo had crossed a back-water, and was standing on the far bank, so I approached the edge of the water on my side with the greatest caution, and halted behind a bush growing almost in it, in order to reconnoitre. The buffalo went off before I could get a shot, but I was rewarded for my care in seeing six Golden-eye playing about in the water within ten yards of me. They were chasing one

another about, and scattering the shallow water in every direction. It was not deep enough to admit of long dives, and the birds principally got about by skittering along, half swimming, half flying along the surface of it. Every now and then two birds would stop and begin bowing and bobbing to one another; this would continue for a minute or two, and then away they would go and join in the rough-and-tumble games of the other birds. In the course of their chases of one another they would sometimes come within a yard or two of where I was hiding, but it was not until I had watched them for a good half-hour that one of them saw me, and was on the wing at once with a loud squawk, repeated by the other birds as they followed suit. This was the only loud noise they made, though they made a very faint sound, half chattering, half quacking, as they played together.

I also shot a female Golden-eye at the Hinjri bheel in north Lakhimpur, on the 18th December, 1901. This bird was in company with a flock of gadwall, and I saw no others either on this or on any of the adjoining bheels. It flew well with the gadwall, but looked conspicuously smaller, and when I fired I thought it was merely a white-eyed pochard.

In 1911 a number of Golden-eye must have visited India, for Mr. Dempster sent two specimens, and Mr. Hughes one specimen from Jhelum to the Bombay Natural History Society, whilst a fourth was also sent from Roorki by Mr. Cunningham, and the same year Mr. Hope Simpson killed two at Gorakhpur.

Delmé-Radcliffe records that they appear yearly on the Khushtil Khan Lake in Baluchistan and are shot.

Nidification.—Normally the Golden-eye breeds in hollows in trees, or, less often, in holes in the ground, in banks, or in rocks, but sometimes it makes a nest on the ground in the same manner as most other ducks. In the latter case the nest is usually rather scanty and ill-formed, but with a thick lining.

Seebohm, writing of this species, observes:—

“ But the most remarkable fact in the history of the Golden Eye is its habit of occasionally perching on the bare branch of some forest tree, and of discovering a hole in the trunk, sometimes quite a small one, but leading to a hollow inside, where it deposits its eggs

on the rotten chips of wood without any nest, like a woodpecker. These breeding-places are sometimes a considerable distance from the ground. In the valley of the Petchora I have seen one at least twenty-five feet from the ground; but one I saw in the valley of the Yenesay was not more than half as high. It has been seen to convey its young one by one down to the water pressed between its bill and its breast."

Dresser's remarks *re* the breeding of the Golden-eye have been already quoted by Hume, and I again reproduce part of them:—

"In the north of Finland, in Sweden, and in Norway, it nests in hollow trees, either near to or at some distance from the water, and very frequently in the nest-boxes which the peasants hang up for water-fowl to breed in. These are frequently hung up close to the peasants' huts; and even then the Golden Eye will nest in them. The bottom of a hollow tree or nest-box is neatly lined with down; and on this soft bed the eggs, which vary in number from ten or twelve to seventeen or even nineteen, are deposited. When hatched, the young birds are carried by the female in her beak down to the ground, or to the water, one after another being taken down until the whole brood is taken in safety from the elevated breeding-place, and I have been assured by the peasants that this always takes place in the dead of the night. The eggs of this duck are dull greyish-green, uniform in tinge, and rather glossy in texture of shell, oval in shape, and in size average about $2\cdot4 \times 1\cdot55$ inches; and the down with which the nest is lined is sooty greyish-white, the tips of the down being rather darker than the central portion."

It would seem that, in the majority of cases, Golden-eye select sites by fresh water for breeding-purposes, but they also sometimes breed on or near the coast. *

Oates describes the nest-down as pale lavender-grey with paler centres.

The British Museum eggs vary in length from $2\cdot1$ to $2\cdot4$ inches, and in breadth between $1\cdot55$ and $1\cdot75$. Oates says that in colour they are greyish-green of different shades.

I have parts of two clutches of eggs of this duck in my collection, both of which I owe to the generosity of Herr Kuschel, of Breslau. The first clutch, which are marked "Sarepta, Süd-Russland, 4th May, 1889," are the greenest ducks' eggs I have ever seen, quite a vivid stone-green, though the three vary a little, *inter se*, in brightness of tint and intensity of colour. The texture is very fine

and close, with an extremely smooth surface and a strong gloss. The shape of two of these eggs is a very regular broad oval, of the third a narrower oval with one end decidedly compressed and smaller than the other, but not at all pointed.

The other three eggs are similar, but less intensely green.

Hartert gives the measurements of 170 eggs as follows:—

Average	55.19×42.55 mm. (= 2.17×1.68 inches)
Maxima	67.0×39.5 mm. (= 2.63×1.55 inches) and
	60.0×45.0 mm. (= 2.37×1.77 inches)
Minima	52.0×41.0 mm. (= 2.04×1.60 inches) and
	55.0×39.4 mm. (= 2.17×1.55 inches).

Morris says:—

“The Golden Eye builds in the vicinity of lakes and rivers, giving a preference to the latter, particularly such as flow over falls and rapids. The Laplanders place boxes with holes in them in the trees in these localities for the birds to build in, and thus procure the eggs, for the boxes are sure to be resorted to for the purpose of laying in.

“The nest is made of rushes and other herbage lined with down. Mr. Hewitson found one in a hole in a tree, ten or twelve feet from the ground.

“The eggs are of a greenish hue, and from ten to fourteen in number.”

The egg depicted by Morris, however, is of a greenish stone-colour, the green tint by no means very prominent. It is also more pointed at the smaller end than any egg I have ever seen.

General Habits.—In its actions and habits the Golden-eye seems to be very much like the pochards. Like them, it is a wonderful bird on the water as well as in it, and what I have said of the Tufted Pochard and its predilection for diving and swimming, and, if possible, escaping by these means rather than by flight, would equally well apply to this bird. Like the pochards, too, it is slow off the water, and rises at an oblique angle with great splashing and commotion. Macgillivray says that it is capable of rising off the water at one spring with the help of a breeze, i.e., probably with a strong head-wind, which, getting under it, would lift a bird at once.

Unlike the pochards, however, it is credited with being fairly active on land, and the author just quoted says that it sometimes reposes on spits of land.

Just as are the pochards, so is this bird found alike on salt and fresh water, but there is no doubt that it prefers fresh water to salt. It would seem that open waters are preferred to small enclosed pieces, and deep clear water to shallow vegetation-covered pools and swamps. This, of course, we should expect to be the case with a diving-duck whose food consists, as the Golden-eye's does, almost entirely of animal matter procured by diving.

It is said to feed on "testaceous mollusca, crustacea and fishes," also on water-insects and grubs, and, but not often, also on vegetable food, principally deep-water weed-roots and similar articles.

Its flight is swift and strong, and Macgillivray says:—

"They fly with rapidity in a direct manner; their small, stiff, sharp-pointed wings producing a whistling sound, which in calm weather may be heard a considerable distance."

Sir Ralph Payne-Gallwey also notes:—

"The wings of this species are so short and stiff in proportion to its weight and size, and are forced to beat so quickly to project its body, that a distinct whistle may be heard as it flies by."

He also writes anent its diving powers:—

"Scaup or Pochard that may have been under water at the moment of firing, after finishing their dive for food at leisure, will startle the fowler by rising close to him as he pushes up to gather his cripples. Golden Eyes seem to know when their companions are leaving the surface in flight, and will at once spring up to follow and join the rest. I never knew them incautiously rise within range after a shot, like the other species alluded to."

Mr. John Cordeaux ('Birds of the Humber District') observes that when diving it remains immersed on an average from forty-five to fifty seconds.

Macgillivray describes the cry of this bird as "a mere grunting croak, and is never heard to any considerable distance; the epithet *Clangula* given to it by the earlier ornithologists had reference, not to its voice, but to the whistling of its wings."

The number of individuals in the flocks seems to vary greatly; in India no large flocks are likely to be seen, but it will be noted that, even on the Indus, Stoker and Yerbury met with small flocks, not pairs and single birds, and, where common, the bird is said sometimes to assemble in flocks of some hundreds.

Sub-family OXYURINÆ.

The one great distinctive feature of this sub-family is the remarkable tail, of which the eighteen feathers are stiff and hard, very much as are the feathers of a woodpecker's tail.

The sub-family contains four genera: *Thalassiornis*, confined to South Africa; *Nomonyx*, to Tropical America; *Biziura*, which is only found in Australia; and finally, *Oxyura*, which is almost cosmopolitan.

The first three genera consist of but one species each; but *Oxyura*, the only genus in which we are interested, has no less than seven, one of which, *O. leucocephala*, extends into India.

This bird has, in addition to the remarkable tail, another feature almost equally remarkable, viz., the swollen base to the bill, which extends forward as far as the nostril. The nail is also very small and is bent inwards; the wing very small; and the feet very large and powerful, with the lobe to the hind-toe very fully developed.

The generic name *Erismatura* by which we have hitherto known this duck in India is later than that of Bonaparte, *Oxyura*, so the latter must take its place.

(45) OXYURA LEUCOCEPHALA.

THE WHITE-HEADED OR STIFF-TAIL DUCK.

Anas leucocephala, *Scopoli*, *Ann. I. Hist. Nat.* p. 65 (1769) (North Italy).

Erismatura leucocephala, *Hume & Marsh. Game-B.* iii, p. 289; *Hume, S. F.* viii, p. 456; ix, p. 296; x, p. 158; *Salvadori, Cat. B. M.* xxvii, p. 442; *F. Finn, P. A. S. B.* 1896, p. 62; *Sherwood, J. B. N. H. S.* xi, p. 150; *Unwin, ibid.* p. 169; *Stuart Baker, ibid.* xiii, p. 20 (1900); *Macnab, ibid.* p. 182; *Blanford, Avifauna B. I.* iv, p. 466; *Oates, Game-B.* ii, pp. 374, 375; *Stuart Baker, Indian Ducks*, p. 255 (1908); *Tenison, J. B. N. H. S.* xix, p. 264 (1909); *Logan-Hume, ibid.* xx, p. 1156 (1911); *Bailey, ibid.* xxiv, p. 599 (1916).

Oxyura leucocephala, *Hartert, Vog. Pal.* p. 1373 (1920).

Description. Adult Male.—“Crown black; forehead, sides of the head, including the space above the eye, chin and nape pure white; below this white the neck all round is black; lower neck and breast chestnut-red, with narrow blackish bars; back, scapulars, sides, and flanks reddish chestnut, more or less buffish, and finely and irregularly vermiculated with blackish; upper tail-coverts deep chestnut; under parts, below the breast, reddish buffy white; wings brown-grey, the wing-coverts and secondaries finely vermiculated with buffy-white; under wing-coverts grey, the central ones whitish; axillaries white; tail blackish; bill blue; iris dark brown; feet ashy-brown, with the webs black. Total length about 18·5 inches, wing 6·5, tail 4·5, culmen 1·9, tarsus 1·3.” (*Salvadori*.)

Measurements.—“Total length about 18 inches, tail 3·5 (3 to 4·5), wing 6·8, tarsus 1, bill from gape 1·9.” (*Blanford*.)

“Females and Young Males have only the chin, lower cheeks, and a stripe from above the gape, running back under the eye towards the nape, white, rest of the head black mixed with rufous; the upper tail-coverts are like the rest of the upper parts, and the breast is dull rufous without black bars. Otherwise the plumage resembles that of adult males. Some specimens are much more rufous than others.” (*Blanford*.)

Colours of soft parts.—“Bill dull plumbeous; irides dark brown; legs plumbeous-black.” (*Salvadori*.)

Capt. Macnab gives the dimensions of a female as follows:—

Measurements.—“Length 16½ inches, wing 6½, tail from vent 3¾, tarsus 1¾, hind toe and claw 2¾, bill at point 1¾, bill from gape 1½.”



THE WHITE-HEADED OR STIFF-TAIL DUCK

Oxyura leucocephala.

$\frac{1}{3}$ nat. size.

Young Male.—“Very similar in plumage to the old female, only somewhat more ruddy on the back.” (*Salvadori.*)

Young in Down.—“Brown-grey; upper part of the head and cheeks dark-brown; a streak below the eye, from the base of the bill to the nape, throat, and sides of the upper part of the neck dull greyish-white undulated with dusky; a whitish spot on each side of the rump just below the wings; edge of the wing and under wing-coverts whitish.” (*Salvadori.*)

Distribution.—The White-headed Duck inhabits the countries surrounding the Mediterranean, and extends thence into Western Central Asia, and, according to Finsch, as far north as Southern Siberia, and also, as a straggler only, into Germany and Holland, being, over the greater portion of its range, either resident or only locally migratory.

In India it is undoubtedly a very rare duck. When Hume and Marshall published the ‘Game-Birds,’ the only record of the Stiff-tail Duck was the following:—

“On the 20th October, 1879, Col. O. B. St. John, R.E., at that time Governor, I think, of Kandahar, shot a couple of ducks, of a type quite unknown to him, in the Jumeh river, near Khelat-i-ghilzai. These ducks proved to be an immature pair of the White-headed Duck.”

Since this was written, however, there have been further comparatively numerous records of this duck. In ‘Stray Feathers’ (*in loc. cit.*) are the following. Mr. Field writes of a bird sent to Mr. Hume:—

“I shot this bird on the 28th October at the ‘Old Nullah,’ about a mile from the Civil Station of Ludhiana, Punjab. It was sitting alone in a pool. I stalked up close behind some reeds, and then showed myself, expecting to see it fly. All it did was to cock its little stiff, thin, pointed tail, and swim off in a quiet way for some ten yards. Its appearance, while swimming with its tail upturned, was most peculiar. I tried to frighten it into flying, but it would not rise; so I shot it whilst swimming.”

Mr. Hume thought records of this bird would soon come to hand after this was written, and with reason, for “on the 21st January, 1882, Mr. Chill obtained an immature male of this species near the Najafgarh jheel (approximately lat. 29° N., long. 77° E.), and again, another near the same locality on the 28th October of the same year.”

" Since this was written, Mr. Lean, of the 5th Bengal Cavalry, informs me that he has just shot a duck of this species in the Phili-bheet district."

Again, in the same volume of 'Stray Feathers,' appears a note by Mr. Chill, dated 8th February, 1883:—

" On the 27th December last, I sent you in a tin box an *Erismatura leucocephala*. Since that I have managed to purchase two more of that species—one a cat took away, and the other I have got stuffed."

These were apparently got near Faruknagar, near Delhi.

About this time (February, 1883) Mr. Bomford also got a specimen on the Indus, at Multan, Keengurh.

From this time none are recorded until Lieut. Burke shot one at Halkote in February, 1891.

The next recorded specimen was not met with until almost exactly two years later, when, in the 'Proceedings of the Asiatic Society of Bengal,' occurs the following note by Mr. Finn:—

" (*Erismatura leucocephala*). The present individual was sent to the editor of the *Asian* newspaper by Capt. H. R. Davis, who stated (*Asian*, Feb. 14th, 1896) that it was shot by Capt. E. D. White, 52nd Light Infantry, at Bettiah, near Hardoi, between Lucknow and Bareilly. It is in heavy moult and quite incapable of flight, which, considering the time of its occurrence, is rather surprising, and almost looks as if the species might be somewhere resident within our limits."

Yet again, in 1896, but on December 27, Major J. C. P. Onslow, R.E., shot two, and Mr. H. B. Campbell one of these ducks, in the Ganges Kadur, about twenty miles south of Kadur.

The Stiff-tail is mentioned in the list of birds in Mr. W. R. Lawrence's recently published work on the 'Valley of Kashmir' as having occurred in that country.

Colonel Unwin reports this little duck as having been obtained several times in March 1907 in Kashmir, but gives no details of what specimens were secured; and prior to this, in the 'Asian' of the 8th February, 1898, A. E. W. recorded having shot three Stiff-tail Ducks in that State in amongst a vast number of other birds shot at the same time. Captain Macnab records shooting a female of this species at Mardan, Peshawar, in November, 1899. Mr. Kennard also shot one in Srinagar in 1906.

Finn, again in the columns of the 'Asian,' says that twice, to his knowledge, this duck has been obtained in the Calcutta Bazaar.

There is also a specimen in the British Museum, obtained by General Kinloch in Peshawar.

In 1908 Tenison shot a pair of immature birds near Nowshera and Ommaney secured one at Sukkur.

On the Baluchistan frontier Stiff-tail Ducks may be said to occur almost regularly and in some numbers. Whitehead recorded them in 1906—7 at Kohat, Logan-Hume reported many seen and several shot there in 1910—11, and again Bailey the same in 1916, and in this latter year, Captain J. E. B. Hotson sent five specimens from Zangi Nawar to the Bombay Museum.

Of the birds whose age is recorded, only two would appear to have been adult birds—the male got at Peshawar and the female at Ludhiana.

It will be noted, also, that nearly all the birds were obtained between the 20th October and the 8th February, and whilst the bird shot at Hardoi in January was in heavy moult, none of the others, so far as we know, appeared to have been moulting at all. Therefore it is very doubtful whether this particular specimen had not been indulging in an abnormal moult. I do not consider it of any weight in reference to the bird being a resident or otherwise; all that we know at present pointing strongly to the fact that it is *not* resident. There is, however, no reason why this duck should not breed in Kashmir, which is quite far enough north; and it is to be hoped that anyone working the water-breeding birds of that State will bear this in mind.

Nidification.—The species breeds inland on lakes and marshes, and also on small ponds, placing its nest in amongst dense herbage at the edges, and always well-concealed. It is a typical duck's nest, containing perhaps more wet weeds and rotten material in the base than do those of most other ducks, but, like them, well lined with down, which in this case is said to be pure white.

The eggs vary from six to ten, are a chalky-white in colour, often much discoloured and stained, very large for the size of the bird, and remarkable for their very rough surface; so rough indeed is it, that this egg is chosen to represent those having rough surfaces in the National Collection of typical eggs.

A few eggs are said to have a very faint green tinge.

Most eggs are almost perfect ellipses, a few having one end rather smaller than the other.

Hartert gives the measurement of seventy eggs as follows:—

Average	<u>66'35</u>	\times	<u>50'7</u>	mm. (= <u>2'61</u> \times <u>2'00</u> inches).
Maxima	<u>71'4</u>	\times	<u>48'5</u>	mm. (= <u>2'81</u> \times <u>1'92</u> inches) and
	<u>68'1</u>	\times	<u>53'5</u>	mm. (= <u>2'68</u> \times <u>2'1</u> inches).
Minima	<u>62'8</u>	\times	<u>52'0</u>	mm. (= <u>2'46</u> \times <u>2'14</u> inches) and
	<u>66'0</u>	\times	<u>48'0</u>	mm. (= <u>2'6</u> \times <u>1'9</u> inches).

General Habits.—As regards its habits, we have very little on record as far as India is concerned. Finn notes:—

“In habits the Stiff-Tail resembles a grebe rather than a duck. It is more ready to dive than to fly, swims low with its tail raised, and it is said to be unable to walk—*though this I doubt*—though I have only had a cripple to study. This bird resembled a grebe in its remarkable tameness.”

Captain Sherwood writes in the ‘B.N.H.S. Journal’ :—

“This bird was very little longer, if any, than a common teal, but much bigger, and presented a stumpy appearance, very ugly and ungainly. The wings were hardly more than six inches in length. The birds were shot in deep water, in a nullah, which they refused to leave after being put up, and after a short swift flight they settled again.”

Some interesting notes are also given of the female already referred to as having been shot by Captain Macnab. He says:—

“On getting closer, however, though its bill and the carriage of its head gave it the appearance of a duck, its tail, which it carried cocked at right-angles to its body, and its habit of constantly diving and remaining under the surface for a considerable time, led me to doubt if it was a duck at all . . . I determined to shoot it for the sake of identification.

“ . . . As I approached, a hawk came on the scene and hovered over it, evidently imagining that it had found its breakfast; and I sat down to see what would happen, and in order to watch the bird more intently before shooting it. What did happen was that whenever the hawk poised itself in the air preparatory to attacking, the duck dived under continually, and, on reappearing after some twenty or thirty seconds, immediately disappeared again, keeping all the time very much in the same place.

"After some five minutes of this the hawk went off disappointed, and I now approached nearer still . . . It was swimming very low on the water; . . . its tail was carried, when swimming, always at a right-angle to its body; . . . when it dived, the tail was straightened out, and then appeared much longer. . . . It would not rise as I came nearer, but merely swam away from me, diving every now and then.

"In this tank Major Barton procured a male in December, 1901, of which he remarks: 'It came up several times, only showing its head and neck, the body and tail remaining under water.'"

These brief notes agree well with what has been written on the bird as it shows itself in Europe. From this it would appear that, whilst the bird is a wonderful swimmer and diver, it is almost helpless on land, and though of very quick flight, it is very loath to take to wing, not rising until absolutely forced to do so, and then only flying for a very short distance, after which it re-settles, and is then harder than ever to again get off the water.

It has, according to Naumann, the power of swimming in the water with only head and neck projecting in the same manner as the birds of the genus *Anhinga* or *Plotus* and the Cormorants do.

Most authors agree that it swims with its tail upright, as observed by Finn, Chill, Field, and others in India; but Chapman and Buck, in their 'Wild Spain,' give quite a different description.

"The most extraordinary wildfowl we ever met with—gambolling and splashing about on the water, chasing each other, now above, now beneath its surface, like a school of porpoises; they appeared half-birds, half-water tortoises. . . . Presently the strangers entered a small reed-margined bight, swimming very deep, only their turtle-shaped backs and heads in sight; . . . with small wings like a Grebe, and long stiff tail like a Cormorant; the latter, being carried under water as a rudder, is not visible when the bird is swimming."

It is a fresh-water species, and, as far as I can ascertain, does not haunt coasts and salt-water.

Sub-family MERGINÆ.

This sub-family is at once distinguishable from all others by its bill, which differs very greatly from the shape most generally considered typical of a duck. Instead of being considerably depressed in the ordinary manner, it is actually compressed, and instead of having the usual lamellæ along the sides, has regular tooth-like serrations on the edges of both upper and lower mandible. This last characteristic suffices to distinguish the *Merginæ* from the *Merganettinæ*, a sub-family which has neither teeth nor serrations, but which is not represented in India.

The *Merginæ* consist of two genera only, as represented in India, with one other (*Lophodytes*) confined to North America.

Key to Genera.

- a. Culmen shorter than tarsus, under 1.5 inches; wing about 7 to 8 inches Mergus, p. 261.*
- b. Culmen longer than tarsus, over 1.9 inches; wing about 9 to 11 inches Merganser, p. 268.*



THE SMEW.
Mergus albellus

$\frac{1}{3}$ nat. size

Female.

male.

Genus MERGUS.

The genus *Mergus* contains but a single species, the well-known Smew (*Mergus albellus*). Its curious narrow beak and its much smaller size than either of the *Mergansers* will at once serve to distinguish it from all other species of ducks found in India.

(46) MERGUS ALBELLUS.

THE SMEW.

Mergus albellus, Linn. *S. N.* x. ed. i, p. 129 (1758) (Smyrna); *Salvadori*, *Cat. B. M.* xxvii, p. 464; *Blanford*, *Avifauna B. I.* iv, p. 467; *Oates*, *Game-B.* ii, p. 413; *Rattray*, *J. B. N. H. S.* xii, p. 348; *Stuart Baker*, *ibid.* xiii, p. 200 (1900); *id. Indian Ducks*, p. 262 (1908); *Francis*, *J. B. N. H. S.* xx, p. 224 (1910).

Mergellus albellus, *Jerdon*, *B. of I.* iii, p. 818; *Hume*, *S. F.* i, p. 265; *Butler & Hume*, *ibid.* iv, p. 31; *Butler*, *ibid.* vii, p. 188; *Ball*, *ibid.* p. 233; *Hume*, *Cat. No.* 973; *Hume & Marsh. Game-B.* iii, p. 293; *Reid*, *S. F.* x, p. 95; *Barnes*, *B. of Bom.* p. 417; *Oates*, *Game-B.* ii, p. 413.

Description. Adult Male.—A large patch from base of both mandibles to back of eye and including base of ear-coverts black, with green reflections; subordinate and lateral feathers of the crest the same, the black extending in a narrow line, more or less, on the sides of the head; a crescentic black band above the upper back, descending down on either side of the breast; back black, duller on the lower back, and changing to brown-grey on the rump and upper tail-coverts, where the feathers are dark-centred; rest of head and whole lower surface white, under aspect of tail pale-grey, the feathers white-shafted except at the tips; primaries brown, dark-shafted above, white-shafted below; outer secondaries black with white tips, the next two or three white, the innermost silver-grey with dark shafts and white outer edges; greater coverts black, those over the secondaries tipped

with white; median white, the remainder black; scapulars white, the outer webs edged black, giving them a barred appearance, and with a black bar across the base from the centre of the upper back, past the shoulder of the wing, and on the sides of the body; these and the flanks are white, very finely barred with black.

Colours of soft parts.—“Bill bluish lead-colour; nail generally brown, often paler; irides brown; legs and feet lavender-grey.” (*Blanford.*)

“Bill of a bluish lead-colour; irides bluish-white; legs and feet bluish-lead, webs darker.” (*Salvadori.*)

“In fourteen specimens I have recorded the irides as brown or deep brown in one as red-brown, and I have observed no other colour. Macgillivray records it from fresh specimens, examined by himself, as red and bright red; Naumann says that in the young it is dark brown, then nut-brown, in males of the second year brownish-grey, later light ash-grey, and in very old males a pure pearl-colour or bluish-white.

“The bill is, as a rule, pale plumbeous, sometimes a clearer and bluer tint, sometimes duskier, and in some specimens, young of both sexes and old females, it has been almost black.

“The nail is generally brownish, horny-whitish at the extreme tip, but in some it has been bluish-white throughout, and in some almost black throughout.

“The legs and feet vary from pale blue-grey to plumbeous and dark lavender; the webs, except just where they join the toes, being dusky to black, and the claws brownish-black. Often there is an olive tinge on the tarsi, and occasionally—in the young only, I think—both these and the toes exhibit small dusky spots and patches.”

Measurements.—“Length 17 to 18·1 inches, wing 7·55 to 8·32, tail from vent 3·35 to 4·1, tarsus 1·2 to 1·31, bill from gape 1·63 to 1·72. Weight 1 lb. 4 oz. to 1 lb. 12 oz.” (*Hume.*)

Female.—The black loreal patch in the male is replaced by rich dark-brown, almost black in very old females; whole upper head, crest, and nape ferruginous-brown, richest and reddest at the end of the crest. Upper back grey-brown, changing to blackish-brown on the lower back and again to dark grey-brown on the rump, upper tail-coverts and tail; wings like those of the male, but the inner secondaries darker and browner, and the lesser coverts brown instead of black; breast mottled-grey; rest of lower plumage white, the flanks more or less mottled with dark-brown, axillaries white.

Colour of the soft parts would seem to be the same in the females as in the males, but the irides are always brown.

Measurements.—“Length 15·5 to 16·75 inches, wing 7·01 to 7·3, tail from vent 3·3 to 3·9, tarsus 1·11 to 1·19, bill from gape 1·48 to 1·6. Weight 1 lb. to 1 lb. 6½ ozs.” (*Hume.*)

Males in post-nuptial plumage assume the plumage of the female, but appear to have the white wing-bar larger and the lesser wing-coverts

darker. They also "show the two dark crescentic bands on the breast." (*Salvadori*.)

"Males in the first nuptial dress have brown streaks on the hind-neck and scapulars." (Seebohm.)

The Young resemble the adult female, but have no dark defined loreal patch, and the crest is darker and rather duller. The white wing-patch is suffused with brown, more or less, and the breast is more spotted.

Young in Down.—"Upper parts, including the sides of the head below the eye, but only the back of the neck, dark-brown; below the eye a very small white spot; white spots on the posterior edge of the wing, on the sides of the back, just near the joint of the wing, the sides of the rump, and on the flanks; throat and sides of the upper part of the neck conspicuously white; crop-region dusky; flanks brown; breast and abdomen white." (*Salvadori*.)

Distribution.—The habitat of the Smew during the summer and breeding-season is practically the Palæarctic Region throughout Europe and Asia, whence it descends south into Southern European countries, the basin of the Mediterranean, Northern India and adjoining countries, China and Japan; and very rarely, also, it has been recorded from North America.

As regards its occurrence in India, Blanford writes:—

"Within our limits the Smew is fairly common in winter in the Punjab, and is found in Sind, Northern Guzerat, the Northwest Provinces, and Oudh. Jerdon records it from Cuttack, and I met with it more than once near Raniganj in Bengal, but it has not been observed farther east nor in Southern India."

To this I can add that I think that once in 1882 I saw a flock of these birds, five of them, near Hazaribagh in Chota Nagpur. It is very unlikely that I could have made a mistake in my identification, and I have no doubt, myself, about what they were; still, I failed to shoot one, so that record is not a perfect one.

In the rivers of Assam, where I expected to find this bird comparatively common in the cold weather, I have seen only two flocks—one of four birds in Ranganadi, in Lakhimpur, and one of six birds in the extreme north-eastern reaches of the Brahmapootra. I have also had one other notification of its occurrence from the same place; and Mr. J. Needham, for many years Political Officer in Sadiya, told me he had occasionally met with it, but that he had never obtained a shot.

I can find nothing further *re* this bird being obtained in India, beyond the fact that in the British Museum Catalogue there are three birds, “♂ ♀ ad. et ♂ juv. sk.,” obtained by Falconer in Bengal. As Oates remarks, there is no reason why it should not be obtained in Northern Burma, as it extends further east and south in China.

Even in Northern India it can nowhere be called a common bird, though there are some places to which it resorts with comparative regularity, though never, it would seem, in large numbers. In Bengal it is nowhere anything but a straggler, and Cuttack would appear to be its extreme limit in the south.

Nidification.—As regards the breeding of the Smew, there is not very much on record, and what little has been recorded by various authors is with reference to eggs got from other people.

Weire says he took what he believed to be eggs of this species near Griefswald in Germany, but there was little by which he could identify them beyond the size and colour of the eggs, and the fact that they were taken from a hollow tree. He did not obtain or see the parents, and though he was very likely right in his identification, the eggs cannot be accepted as authentic without doubt.

Mr. J. Wolley, in the ‘Ibis’ for 1859, pp. 69-76, described at considerable length how he obtained eggs of the Smew, through a certain Carl Leppajervi, from Sodankyla. After trying for a long time to obtain eggs, without the slightest success, he received a small wooden box addressed “To the English Gentleman Joh Woleg in Muoniovaara.” In this box, amongst other things, there was the head of a female Smew and three eggs, part of a clutch of seven. These three eggs were described by Wolley as follows:—

“On comparing them with a series of something like fifty Wigeon’s eggs, I found they were pretty nearly of the same size, though rather below the average. They were flattened at the small end more than any of the Wigeon’s, and they had less of the yellow tinge about them, so that persons not much used to eggs could pick them out of the lot; but all these peculiarities might be accidental, though it seemed remarkable that any woodsman trying to pass off Wigeon’s eggs for Smew’s should have been able to find so abnormal a nest. But it was not very long before I satisfied myself that there was a decided difference of texture. This could be perceived on an ordinary examination; but it became very striking on exposing the

egg to direct sunshine and examining the penumbra, or space between full light and full shadow, with a magnifying glass—the sharp 'mountainous' structure of the Wigeon's egg was strongly contrasted with the lower and more rounded character of the elevations in the Smew's. . . . Further, I tried the sense of touch: scratching the egg with the most sensitive of my finger-nails I could at once perceive the greater roughness of the Wigeon's The ivory-like texture of the Goosander's egg was a pretty parallel to the character of the Smew's."

Afterwards, Wolley received from the priest Liljeblad the other four eggs of the set, and with them the rest of the remains of the duck Smew, the head of which had been sent to him with the first three.

The dimensions of these eggs he gives as from 2·04 to 2·05 inches in length, and from 1·42 to 1·52 in breadth.

They are described by Wolley at great length, but briefly may be said to have been broad ovals, one end very much smaller than the other, yet decidedly obtuse.

Seebohm and Harvie-Brown obtained the eggs from the peasants in North-east Russia; these were obtained from hollows in trees, lined thickly with the usual pale-grey down.

According to Oates,

"Some of these eggs brought by Mr. Seebohm from Petchora are now in the British Museum. They are nearly elliptical in shape, very smooth and glossy. They are of a pale cream-colour, and measure from 1·9 to 2·05 inches in length, and from 1·42 to 1·52 in breadth.

"The Smew generally breeds in the month of July, and lays seven or eight eggs, which are placed in a hollow of a tree or in one of the boxes hung up by the villagers for the use of the Golden-eye."

Morris, in 'British Birds,' says:—

"The nest of the Smew is made of dry grass, and lined with the down of the bird itself. It is placed on the ground upon the banks of lakes and rivers, not far from the water, or in the hollow of a tree.

"The eggs are said to be eight or ten, or from that to fourteen in number, and of a yellowish-white colour."

The egg, as shown by him in a plate, is a bright deep buff. One egg of this species in my collection I owe, as I do many of my rarer ducks' eggs, to the generosity of Herr Kuschel.

In general description my egg agrees very well with those

obtained by Seebohm and described by Oates. It is much stained, but where the original colour shows, it is an extremely pale, rather clear cream. It measures $1\cdot95 \times 1\cdot47$ inches, and was taken in Finland on the 6th June, 1895. It appears to me to have been considerably incubated at the time it was taken, so Smews must, sometimes at least, breed long before July, which is the month in which the greater number are said to breed. Another clutch, obtained through Skinner, St. Mary's Cray, agrees exactly with Kuschel's egg, and the dimensions come within the limits already given. These eggs were taken in Lapland in the month of June; a third clutch of five taken with the down also agree in size, shape and colour with those already described.

Hartert gives the average of 107 eggs as $52\cdot42 \times 37\cdot46$ mm. ($2\cdot06 \times 1\cdot47$ inches).

My thirteen eggs average $2\cdot0 \times 1\cdot45$ inches.

General Habits.—In their northern home Smews generally congregate in flocks, numbering anything from a dozen or so to nearly a couple of hundred, flocks of over fifty being the exception. Here, in India, even the latter number is very exceptional indeed, and most birds are seen in comparatively small parties of a dozen to twenty. Hume mentions as few as seven, and I once saw four together, but there seem to be few records of single birds or pairs having been obtained, though Francis saw a pair only, of which he obtained the male, at Dehra Ismail Khan. They are as much salt-as fresh-water birds, though they do not seem to have been noticed on our Indian sea-coast. As might be expected of sea-haunting ducks, failing salt-water, they keep almost entirely to large open rivers and lakes; but Hume notes:—

“I have, in unfrequented localities, occasionally seen them on ordinary good-sized jheels, covering, perhaps, barely a square mile.”

They are essentially diving ducks, and, as such, naturally prefer water unencumbered by vegetation and of considerable depth. They are wonderfully quick, active little birds in almost every way. On the wing they are very fast and strong, though they always prefer water to air when possible; they get up very quickly in spite of their short wings, rising lightly and at once getting into full swing. As swimmers and divers few birds can approach them,

probably none can excel them. Hume gives them the reputation of being even better divers than grebes and cormorants, and as he watched them diving after fish, and again when diving in clear water after being slightly wounded, he ought to know. Few of us have been as fortunate as Hume in this respect, but many people have doubtless seen the cormorants and snake-birds being fed at the Zoo and other places, so that we can appreciate what a compliment Hume pays the Smew when he declares it to be smarter even than these.

It swims very fast indeed, and generally seeks escape by swimming and diving rather than by flight, and as it is a very wide-awake and extremely shy bird, it is no easy matter to get within shot. On foot, except perhaps rarely when Smews are found on rivers, it is almost impossible to get a shot, as they always keep well away from the shores and from vegetation, so that the sportsman has but few opportunities for stalking them. Hume, however, tells us that they may sometimes be approached in a boat by sailing past at a distance of about forty yards; in an ordinary native boat it is no use attempting to circumvent the Smew, for he can swim and dive almost as fast as, if not faster than, the boat can travel.

Like the genera *Phalacrocorax* and *Anhinga*, it seems that the Smew makes use of its wings to assist it in diving, and, like these birds, it can swim at will with only its head and neck out of water, though normally it swims with its whole upper part out.

Its food is practically entirely animal, and consists of crustacea, molluscs, water-insects, larvæ, small fishes, &c. The Smew itself is quite unfit for food; even Mr. Finn, who considers that my remarks on the edible qualities of many ducks are rather unflattering, only remarks of this bird, "the flesh is said to be very bad indeed, it being, according to Pallas, *pisculentissima*,"

Mr. Finn also notes ('Asian') :—

"It gets about nimbly enough on land, where, however, it seems to be very rarely seen in a wild state. I judge from captives in the London Zoo."

Other authors have given it a very bad reputation for walking powers; but it is noticeable that most ducks have been very much underrated in this respect, and Mr. Finn has set right a goodly number of antiquated mistakes on this subject.

Genus MERGANSER.

The differences between *Merganser* and *Mergus* have already been defined, and there is no other genus found, or likely to be found, in India with which it can possibly be confounded.

According to Salvadori, there are seven species in this genus, but he divides *Merganser merganser* into two species, and the Indian form he designates *Merganser comatus* and distinguishes as being

"somewhat smaller, the feathers of the crest thinner, narrower and longer; the bill usually shorter; the male has the black edges of the tertials broader, the lower back and rump paler grey, and usually much freckled with white."

The Eastern form had, however, already been given a name by Gould in 1875, *orientalis*, which will have to be used instead of *comatus*.

No simpler key to the two Indian species can be found than Blanford's which I give below:—

- A. Head and upper neck black glossed with green. (Adult males.)
 - a'. Lower parts white throughout *M. merganser.*
 - b'. Upper breast rufous with black marks *M. serrator.*
- B. Head and upper neck rufous. (Females and non-adult males.)
 - c'. Chin white, back grey *M. merganser.*
 - d'. Chin streaked with rufous, back brown *M. serrator.*



THE RED-BREASTED MERGANSER.
Merganser serrator.
 $\frac{1}{3}$ nat. size.

(47) MERGANSER MERGANSER ORIENTALIS.

THE EASTERN GOOSANDER.

Mergus orientalis, *Gould*, *P. Z. S.* 1845, p. 1 (Amoy).

Mergus merganser, *Hume*, *Cat. No.* 972; *Scully*, *S. F.* viii, p. 364; *Hume & Marsh. Game-B.* iii, p. 299: *Hume & Cripps, ibid.* xi, p. 347; *Aitken, J. B. N. H. S.* ii, p. 56.

Mergus castor, *Jerdon, B. of I.* iii, p. 817; *Hume, S. F.* i, p. 423; *Parker, ibid.* ii, p. 336; *Ball, ibid.* p. 439; *Hume, ibid.* vii, p. 149; *Ball, ibid.* p. 233.

Merganser castor, *Blanford, Avifauna B. I.* iv, p. 469; *Oates, Game-B.* ii, p. 123; *Stuart Baker, J. B. N. H. S.* xiii, p. 207 (1900); *id. Indian Ducks*, p. 271 (1908); *Inglis, J. B. N. H. S.* xiv, p. 393; *Whitehead, J. B. N. H. S.* xx, p. 980 (1911); *Gouldstone, ibid.* xxi, p. 275 (1911); *Inglis, ibid.* xxiv, p. 600 (1916).

Merganser merganser, *Oates, Game-B.* ii, p. 390.

Merganser comatus, *Salvadori, Cat. B. M.* xxvii, p. 475.

Description. Adult Male.—Whole head, upper neck, and crest black glossed with metallic-green, showing purple in sunlight, the centre of chin and throat unglossed; lower neck and under parts white; upper back glossy black: lower back, rump, and upper tail-coverts grey, more or less vermiculated with white on the outer feathers, and the tail-coverts also with dark shafts and sometimes with paler edges; tail silvery-brown, paler and more grey on the lower surface; primaries and outer secondaries very dark brown; inner secondaries white, with a narrow edging of black on the outer webs; large secondary-coverts white with black bases; primary-coverts and edge of wing black; remaining coverts white; outer scapulars white, with narrow black margins; the inner all black; one or two next the white ones tipped with white or with narrow, irregular white edgings.

Colours of soft parts.—“The bill is, according to age, a brighter or duller, lighter or deeper red, almost vermillion in some, cinnabar or deep blood-red in others. The nail and broader or narrower stripe along the culmen, from the nail to the forehead, brownish-black, dusky or black. In some this stripe is only indicated. There is often more or less of dusky on the lower mandible, which, in some, is entirely of this colour, but in others almost orange.

“The irides, brown in the young, grow redder with age, and in old males become a deep red, with scarcely a tinge of brown.

"The legs and feet, including the webs, are bright vermillion in the old of both sexes, perhaps rather duller in the females, and reddish-orange in younger birds. The claws greyish or horny-white, brownish or reddish towards their bases." (Hume.)

Measurements.—"Length about 25 inches, tail 4.25, wing 9.5, tarsus 2.0, bill from gape 2.7." (Blanford.)

"Wing 10.95 to 11.8 inches, tail from vent 4.80 to 5.9, culmen 1.90 to 2.10, tarsus 1.68 to 1.80." (Salvadori.)

"Wing 10.95 to 12.1 inches, tarsus 1.86 to 2.03, bill from gape 2.25 to 2.6. Weight 2 lbs. 12 ozs. to 3 lbs. 5 ozs." (Hume.)

The weights of the few males I have personally weighed, or obtained the weights of from other sportsmen, have varied between 3 lbs. and 4 lbs. 8 ozs. In both extremes the birds were specimens shot and weighed by myself.

It will be seen from the above that the wing varies from 9.5 to 12.1 inches according to different authorities; but, though I have the measurements of some 40 males, my wing-measurements only vary between 9.6 and 11.2 inches.

Adult Female.—Chin and throat white, and lores somewhat albescent; rest of head and neck dull-rufous, the crown more brown; sides of neck and whole lower surface white, the flanks striped with grey; primaries and first few secondaries dark-brown, the next few white, the innermost grey with dark margins; upper parts grey, rather mottled in appearance, and the upper tail-coverts with dark shafts; tail grey-brown with darker shafts; some of the scapulars very dark brown; the lesser and median wing-coverts mottled grey and greyish-white.

The colours of the soft parts seem to resemble those of the male, but are, on an average, somewhat darker and more dull.

Measurements.—In size it is considerably smaller. Blanford gives the wing at about 9 inches, and Hume as 6.8 to 10.95 inches. The latter gives the weight as being 2 lbs. or 2 lbs. 10 ozs. The wings of the females shot by myself varied between 7.5 and 10.2 inches, and the weight between 2 lbs. 6 ozs. and 3 lbs. 8 ozs. My largest females have been both bigger and heavier than many of my smaller males.

"Young in first plumage closely resemble adult females, but have shorter crests, and brown instead of grey markings on the breast and flanks; males may be distinguished by paler feathers on the median wing-coverts and outer scapulars, and darker feathers on the inner scapulars." (Seeböhm.)

"Males in moulting plumage closely resemble adult females, but have traces of a black ring round the neck, are darker on the back and shoulders, and show the whitish wing of the immature bird." (Seeböhm.)

"Males in first nuptial dress have more grey on the shoulders than adults.

"Young in Down.—Similar to that of *M. serrator*, but perhaps not so dark on the upper parts." (Salvadori.)

A very young, unsexed bird in the Indian Museum, Calcutta, has the upper parts of the head and neck dull rufous, the lower parts white, and the upper parts and tail grey; the back very rufescent, and the wing- and tail-feathers dark-shafted.

Distribution.—The Eastern Goosander is found from Baluchistan, Afghanistan, and Turkestan throughout the Himalayas, Tibet and the North Central Hills of China.

With regard to Indian limits, Hume goes so fully into details that I cannot do better than quote him fully. He writes:—

“In the larger rivers of the Himalayas, though nowhere numerically very abundant, they are so universally distributed high up in summer, low down in winter, that it is needless to specify the particular localities, over seventy in number, whence I have received them or where they have been reported to have been obtained.

“Outside the Himalayas I have received them, or known for certain of their having been obtained, from the Peshawar valley, on the Cabul river; near Attock, Kalabagh, and just above Dehra Ismail Khan on the Indus; near Sealkot, on the Chenab, and smaller streams; the Kangra valley; below Roopur on the Sutlej; Dehra Dun, not only on the Ganges from Rukikes to below Hurdwar, but in the interior; Pilibhit on the Sardeh; the Sandi Jhil, near Hardui (*Irby*); the Kosi river towards the north of the Purneah district; the Western Doars (where they appear to be extremely numerous); the Monas in the Kamrup district; some streams north of Lakhimpur; close to Sadiya; numerous localities near the bases of the Garo and Khasi Hills on both their northern and southern faces, and well inside them; near Jamtara, about 156 miles from Calcutta on the East Indian line of railway (*Brooks*), at a large lake seven miles from Burrakur; on the Grand Trunk Road, where there were some hundreds (*Parker*); on the Damuda in Bankurah and Bardwan; in Manbhumi and Dhalbhum on the Subanrika; Lohardugga (*Ball*); the Mahanadi, near Arung (*Raipur*), and further down almost to Sambalpur (*Blewitt*); this latter district north of the Mahanadi (*Ball*); Palamow (*Money*); and the Sone river near Dehree-on-Sone (*E. Stewart, C. S. W. Forsyth*); lastly, Ajmere, near which place Major O’Moore Creagh, B.C., shot a fine male in a large tank.”

In addition to these places, in ‘Stray Feathers,’ Vol. II, Hume gives Sylhet and Cachar, though I have never seen or heard of Goosanders myself in either of these districts.

The next record is a most important one by E. H. Aitken, and was noted in the 'Journal of the Bom. Nat. Hist. Society' :—

"I shot a Goosander (*Mergus merganser*) at Shewa just across the Bombay Harbour on the 2nd inst. (December). It was a female or immature male, and was playing along in a shallow sheet of water which formed the reservoir of one of the salt-works. I believe this is the most southern point in India from which this bird has yet been recorded."

Oates, merely because it was found in *salt water*, does not accept Mr. Aitken's identification, and thinks it must have been *M. serrator*. I can see no reason for thinking Mr. Aitken was wrong, and accept, fully, Bombay as the most southern point in India in which the Goosander has been obtained.

The next record I can find is that of a Goosander shot by R. F. B. at Myitkyina, Burma, and sent with a note to the 'Asian,' dated 1st March, 1897, the bird having been shot the previous day. This bird was identified by Mr. F. Finn, who kindly notified me of its occurrence.

Oates, in his 'Game-Birds,' says that :—

"The Goosander is a common bird in the Upper Irrawaddy, and occurs in small parties of from two or three to six. Owing to my being obliged to travel about in steamers, I never succeeded in shooting one of these birds, but Commander A. C. Yorstoun kindly procured me one and sent me the skin for identification."

I have myself found it to be extremely common on the Subansiri, and many other hill-rivers and streams, in the cold weather, in flocks of forty upwards, and one flight I estimated at over 200. I should think that on the 25th, 26th, and 27th of January, 1901, I daily, in the river mentioned, saw from 200 to 500 of these birds, on a very small stretch of water. They were extremely wild and wary when one came across them on the water; but when flighting, would often pass up and down within shot of the boat.

As far as I can ascertain, they are equally common on the Dehing, Dibong, and all the larger streams in Assam, and are plentiful on the Brahmapootra itself above Sadiya, being also found now and then as low down as Dibrugarh, or even lower.

Primrose reports them as common and not shy on the Gadadhar in the Goalpara district, where the birds allow boats to approach within thirty yards.

Nidification.—The Eastern Goosander breeds freely throughout the Himalayas in all suitable localities between 12,000 and 15,000 feet, perhaps even higher, but there is very little on record about it.

It certainly breeds in Ladakh in the lake districts and almost equally certainly in parts of Kashmir, Gilgit, etc., although so far there is nothing recorded in reference to these localities.

In Tibet it breeds in great numbers, and from Rhamtso, Gyantse and other places I have had breeding birds and eggs sent me. As far as I can ascertain in Tibet it generally places its nest in some natural hollow low down in a bank or cliff, or even in a burrow on the level, probably because of the want of trees big enough to contain hollows suitable for its purpose. About Gyantse it lays its eggs in hollows in the willows, which are here fairly plentiful and grow to some size, but even here I have had a nest reported to me as having been found in a hollow under a large boulder, unfortunately not until the young had been hatched.

The nest is made of grass alone, with a dense lining of down which is increased in bulk as the eggs are laid.

The eggs are replicas of those of the Common Goosander, but may average smaller, though at present my series is too small to enable me to say so.

Hartert gives the average of 125 eggs of the western form as 68.3×47.15 mm. ($= 2.69 \times 1.85$ inches), whereas my eggs average only 64.5×43.2 mm. ($= 2.54 \times 1.70$ inches).

In colour, shape and texture they cannot in any way be discriminated.

The birds appear to breed from the end of May to the end of July, most eggs being laid in June.

General Habits.—The Eastern Goosander is a permanent resident in India, but during the summer is confined to the Himalayas at various heights above 10,000 feet, whence it descends in the end of October and early November to the foot-hills and into the plains. The limits of its local migrations have been already noted.

In most countries the Goosander is nearly as much a salt-water as a fresh-water frequenter, but here, in India, it seems to be essentially a fresh-water species, and the only record of its having been shot on the sea, within our limits that I can find, is that of Mr.

Aitken. In the Persian Gulf (the form here is possibly the western one) however, it has been frequently obtained, and possibly closer search on our extreme north-western coast might produce more birds. It haunts the larger streams and rivers, keeping to such as have a distinct current and clear water, generally avoiding the more sluggish dirty rivers with muddy bottoms. From what observers have noted, the Goosander likes, rather than dislikes, a rough current, and in the same way it does not appear to be at all troubled by a rough sea; thus Dresser notes meeting a flock in the sea near Guernsey, which was in water rough enough to make the steamer he was in dip its paddle-boxes alternately into the water.

Lakes and still water are not frequented when clear running rivers are adjacent, but sometimes the Goosander may be found on such, though in these cases the water will almost invariably be found to be free of much vegetation and fairly clean and clear. Captain Gudlestone, however, obtained two females on a jheel near Cawnpore, which was dry except for three or four small pools of water.

At the same time, on the Subansiri, Dehing, and Dibong I nearly always found them in the backwaters and dead pools cut off from the river. When in the actual rivers themselves they were generally in deep still pools, but I have sometimes seen them in very strong rapids, where they seemed to enjoy themselves immensely; and they are quite at home in the rough tumbling hill-streams which they frequent in their summer home, and will there be found swimming and diving at their ease with or against the roughest and quickest rapids, as well as sometimes floating idly in some deep pool.

In such places as these the Goosander may occasionally be surprised, the well-wooded banks allowing a near approach and screening the stalker until he actually arrives on the edge of the bank itself. As a rule, however, the Goosander is one of the wariest and wildest of birds, and this whether on salt or fresh water. Should he consider that danger is coming too near, his wonderful powers of swimming are at once called into action to place him out of danger; if hard-pressed he resorts to diving, at which very few birds can surpass him, though he is said not to

equal the Smew in this respect. It is, however, only as a last resource that he takes wing, for, though once well up and away his flight is fairly strong and comparatively swift, he takes long to rise off the water and a long time to get properly under way. In India, as a matter of fact, I consider that the flight of the Goosander, unless he is frightened, is decidedly not swift, though when shot at he can get up a fair pace. The birds rise very obliquely, spattering along the top of the water some yards before clearing it, and even then going some further distance before mounting well into the air and into full flight. Their mode of starting is very similar to that of cormorants and divers, but once fairly started, their flight is then swifter than that of either of those birds, although, as already noted, unless they are actually frightened it is by no means quick. Swimming about undisturbed and with no particular object in view, they float with about one-third to half their bodies exposed, but they can sink themselves at will, and Hume says that, especially when swimming against stream, they sink very deep, as do cormorants, and that when *wounded and pursued*, they never show more than their heads and necks out of water. This is so, as I saw repeatedly in the Subansiri and other rivers of Assam; but this mode of swimming did not seem to be resorted to unless the birds *were* wounded or frightened.

As a rule, all over its wide habitat, it is more common to meet the Goosander in quite small flocks of a dozen or so, or varying from half-a-dozen to a couple of dozen, whilst single birds and pairs are often seen. Sometimes, however, they go in far larger flocks. Cripps writes:—

“ In the Western Dooars I have seen numbers of the species in flocks of from fifty to two hundred.”

One or two other authors have noted large flocks, but, except Cripps, all Indian observers seem to concur in considering very small flocks to be the rule in India. On the Irrawaddy, Oates speaks of meeting them in small parties numbering six or *fewer* individuals. A note sent me by Mr. S., of the Civil Service, from Darbhanga, mentions only seeing comparatively small flocks. My own experience has been that about a dozen birds are most often found in

a flock, but that they join forces during the morning and evening flighting, when flocks of forty or sixty are common, and, as I have mentioned above, sometimes as many as 200 may be seen in one flight.

The food of the Indian Goosander is as purely an animal diet as that of any duck in existence, and the greater portion of it consists of fish, in the diving after which it is wonderfully expert. Very often flocks work in concert in their fishing; sometimes they will gradually work the fish into some narrow inlet, and when they have fairly got them driven into it, will almost exterminate a shoal before the surviving members of it break through the living cordon of greedy birds and make good their escape.

Ball says:—

“In the Subanrika they may be seen in parties swimming against the stream, and all diving together, apparently to catch fish. The sudden disappearance of the whole flock at the same moment gives the idea that they work in concert in hunting the fish which are coming down with the stream. Their flight is very rapid.”

The same mode of fishing has been reported to me by many other observers, and has also come under my own observation on several rivers.

They are most voracious birds, and do a great deal of damage in fishing rivers. Mr. E. T. Booth, in ‘Rough Notes,’ writes of the European bird:—

“Goosanders are blessed with strong, healthy appetites when wounded or alarmed, I have occasionally remarked an immense quantity of fish was thrown up. After a shot at a number of these birds scores of small rudd and roach were discovered lying on the surface where the flock had been resting.”

Again, to quote Mr. Finn from the ‘Asian’:—

“A captive bird I had under observation devoured no less than forty fish, about two inches long, at a meal. No castings were found, but bones and all were digested as by a Cormorant, and the excreta were semi-fluid and very foetid. The stomach of this bird proved to be soft throughout, not hard and muscular like a duck’s gizzard.”

Some time after this was written, Mr. Finn was talking to me about this same Goosander, and he observed to me that the attitude of the bird on the completion of his meal was undoubtedly rather pensive, and he wore a rather strained look about his face, as if he knew he had reached the limit of his carrying capacity. Dr. Moore, of the Planters' Stores in Dibrugarh, took fourteen fish, weighing 9 ozs., from the crop of a male, and on another occasion I extracted 8 ozs. of fish from a male which had, when first wounded, already thrown up some.

The cry with which the Goosander is generally credited is a croak, by no means musical or soft, but Booth describes the note of the female and young as being a soft plaintive whistle.

The only note I have heard was a low guttural quack, uttered both by males and females, and by the latter, only, a low, plaintive, half-hiss, half-whistle. I spent several days on the Subansiri River, which I devoted entirely to obtaining specimens of the Goosander, and they undoubtedly gave me as good sport and as careful stalking as I could wish for, my best day only giving me seven birds brought to book.

Dawn found me on the river in a dug-out, and the cormorants were then already passing in huge flights down to their feeding-grounds, but the Goosanders did not commence to flight until about half-an-hour after the first streaks of daylight appeared. The first flight was a small one of half-a-dozen birds, which passed well out of shot, but these were at once followed by a flight of nearly 100 birds in a long line which stretched nearly half across the stream, and the nearest of these appearing to be within shot, I let drive and dropped two. One, dead, fell almost into the boat, but the other, only wounded, fell with a splash 100 yards away, and at once dived. Paddling as hard as they could, the boatmen took me to the spot in a very few seconds, but as we arrived there, the snake-like head of the Goosander showed from the water nearly as far away as before. The former procedure was again carried out, and again with the same result, and nearly a half-hour's chase had been kept up before I got a snap-shot at the bird as it showed above water. Although again hit, it was not yet done for, but it was getting exhausted, and very soon gave me a fair shot which finished it off.

All this time parties of birds, small and large, had been passing down the river, but none had come within shot of the boat, the excited and gesticulating boatmen warning them off. Our bird gathered, the sun was now high and flighting had ceased, so we turned our attention to the flocks which were sunning themselves on the banks or playing in the streams or backwaters. The latter, however, we soon found to be quite unapproachable, and gave them up in order to try those on the banks.

These we were more successful with, as I found that with care I could stalk them whilst their attention was taken up with the boat. My first two attempts were failures, and I obtained no shot; but the third time a crawl on my stomach of over 200 yards on the sand brought me within about forty yards, and as the flock of some thirty birds rose, I let drive both barrels and dropped seven of them. Of these, two at once rose again and joined the others, one lay kicking on the sand, and the four others were diving in all directions. Then ensued the same kind of chase that I had had after my first bird; but there were now four birds in the water, two going upstream, and two down, and an hour's hard work resulted in only one capture, the other birds very probably leaving the water for the banks, or hiding under the banks themselves.

Further stalks and further chases enabled me to bring the contents of my actual bag up to seven, but, to my regret, no less than half-a-dozen of my wounded birds managed to escape us altogether. They took far more hitting to bring down than most birds; and as shots within fifty yards were exceptional, it was not often they were brought down stone-dead, and as long as they had a kick left in them they kept the boatmen hard at work.

One bird, a female, kept us employed for over half-an-hour without once letting the boat near enough for a shot, and then suddenly appeared floating belly upwards on the water, having died during one of her dives.

They swam under water almost as fast as the boat—a light dug-out with two boatmen—could be propelled, and as a rule they showed up in the water after each dive nearly as far off as before, until they had been chased for some minutes, when their dives began to shorten.

My experience as to their progress on land does not at all agree with what Hume writes. According to him :—

“On land one sees them resting on the water’s edge, and when disturbed they shuffle on their breasts into the river. I do not think that they can walk at all. Anyhow, I have always seen them just half glide, half wriggle, breast foremost, and I think touching the rocks, into the water.”

I found that birds wounded and fallen on land got along wonderfully fast. A male which I winged fell on a spit of sand, scuttled across it into the water, *and again took to the land on the far side*. I ran across after it, and had to run hard to catch it, and only just succeeded in grabbing it as it was about to dive into the deep pool beyond the sand-bank.

When running on land, they assume a very upright position, almost like that of penguins, and they can get along at a very fair pace, though they frequently fall and stumble about when hard-pressed.

Now Hume’s idea may have been due to his having only seen the birds on the very edge of the water, and even tame ducks *when close to the water and on a shelving bank or stone* often seem to wriggle and glide into the water, their breasts practically touching the ground *en route*. Mr. Finn in his articles on ducks, which appeared in the ‘Asian,’ has shown that the Mergansers can walk all right. He says :—

“On shore they move about very little, and are clumsy walkers, although they get about better than one would expect from the published account of their gait.”

For the table the Goosander is quite worthless, and I advise no one to try it as long as *any* other food is obtainable; the only thing to be said in its favour is, that two courses, fish and game (both nasty), may be combined in one. However, Hume says that :—

“They are eatable if skinned, soaked several times, and then stewed with onions and Worcester sauce.”

He remarks that it will form then an abundant meal for a hungry man. Probably it would, or for *several* hungry men.

(48) MERGANSER SERRATOR.

THE RED-BREASTED MERGANSER.

Mergus serrator, *Linn. S. N. x.* ed. p. 129 (1758) (Sweden; (*Hume & Marsh. Game-B.* iii, p. 305; *Hume, S. F.* ix, p. 268; *Barnes, B. of Bom.* p. 416.

Mergus castor, *Hume, S. F.* iv, p. 496; *Butler, ibid. v.* pp. 291, 323.

Merganser serrator, *Salvadori, Cat. B. M.* xxvii. p. 479; *Blanford, Avifauna B. I.* iv, p. 470; *Oates, Game-B.* ii, p. 124; *Stuurt Baker, J. B. N. H. S.* xiii, p. 217 (1908); *Nurse, ibid. xiv*, p. 400; *Oates, Game-B.* ii, p. 402; *Stuart Baker, Indian Ducks*, p. 281 (1908).

Description. Adult Male.—Whole head, crest, and a narrow line down the nape of the neck black, the posterior part of the head and the crest glossed green; neck white; back black; lower back, rump, and upper tail-coverts white and very dark brown in fine wavy lines; the bases of the feathers on the lower back brown and showing a good deal; tail dark-grey, edged paler. The primaries, three outer and innermost secondaries dark-brown, the next white with black bases, and from these to the longest, white with narrow black margins; greater and median coverts white; edge of the wing and smaller coverts brown; breast rather rich rufous-brown, the feathers more or less centred black; the sides of the breast under the shoulder of the wing black, with a patch of feathers white, merely margined with black; outer scapulars white, inner black.

Colours of soft parts.—“In the male the bill varies from orange-red to deep vermillion, is more or less dusky on the ridge, and has the nail varying from pale yellowish-grey to almost black; the feet vary similarly to the bill, and are brighter externally, paler internally, and duller on the webs; the claws are light-grey, duller, and browner or redder, towards their bases.” (*Hume.*)

Measurements.—“Length 24·0 to 26·0 inches, expanse 29·0 to 32·5, wing 9·0 to 10·0, tail from insertion of feathers 3·1 to 4·2, tarsus 1·8 to 2·05, bill at front along culmen 2·4 to 2·5. Weight (*Naumann*) a little over 2 lbs.”

The above dimensions and colours of the soft parts are compiled by Hume from different authors.

Salvadori gives the total length as 21 inches, and the culmen 2·15, whilst he states the tarsus to be only 1·5.

Blanford gives the bill from gape as 2·75 inches.

Adult Female.—Lores and upper part of head and neck pale rufescent-grey, with darker centres to the feathers; a faint supercilium dull rufescent-

white; a dark eye-streak like the lores; chin and throat rufescent-white; remainder of head and neck dull-rufous; upper parts ashy-brown, most of the feathers edged paler; lower parts white; flanks mottled brown and white; primaries and innermost secondaries dark-brown; outer secondaries and their coverts white, the latter with brown bases; remainder of wing-coverts ashy-brown; under wing-coverts grey and white.

Colours of soft parts.—"In the young and females there is more dusky on the upper mandible, where the red is often only a lateral band, and the feet are duller-coloured than in the adult male."

Measurements.—"Length 22'0 to 23'5 inches, expanse 28'0 to 31'0, wing 8'5 to 9'3, tail from insertion of feathers 2'7 to 3'6, tarsus 1'66 to 1'83, bill as above 2'1 to 2'3." (Hume.)

Adult Male in Summer.—"In the plumage that the male of this species assumes for a short time during the summer it resembles the female, but is distinguishable by its larger size, the different colour of the abdomen and of the scapulars." (Dresser.)

"**Young Male** closely resembles the female, especially when the latter is in fresh plumage with a greyish tinge, but can usually be distinguished by its larger size and shorter crest." (Dresser.)

"**Males in first nuptial dress** have the lower back brown, and the white round the neck streaked with brown." (Salvadori.)

"**Young in Down** are dark brown on the upper parts, shading into reddish brown on the head, and into chestnut on the sides of the neck; a white patch on each wing, one on each side of the upper back, and one on each side of the rump; under parts pure white, and lores white, margined above and below with dark brown." (Seehoem.)

Distribution.—The Red-breasted Merganser is found practically throughout the Northern Hemisphere, breeding to the north, and extending south to the Mediterranean basin, through Central Asia to Persia, Northern India, China and Japan, and in America to the United States.

On the whole, it is a more northern bird than the goosander, and is circumpolar, whereas the latter is an eastern or old-world form.

In India there is no doubt that it occurs only as the most rare of stragglers.

The first specimen quoted as being an Indian one, and which was the only one known to Hume at the time 'Game-Birds' was written, was erroneously so recorded. Blanford corrects this mistake; he says:—

"The bird stated in 'Stray Feathers' and in the British Museum Catalogue to have been shot by Captain Bishop at Manora, Karachi Harbour, was really obtained by him at Chahbar, in Persian Baluchistan. This correction is founded on a letter from Captain Bishop to Mr. Cumming, which I have seen."

In 'Stray Feathers' (v, p. 323), Captain (then) E. A. Butler notes:—

"There is a fine specimen, a ♀, of this species in the Frere Hall Museum, shot by Captain Bishop, at the Manora Point off the Karachi Harbour; another specimen has just now been captured, at the end of June."

Both these birds are referred to as *M. castor*, but the first was the *M. serrator* obtained by Captain Bishop at Chahbar, as already noted. Whether the second bird was *M. castor* or *M. serrator* I cannot ascertain.

Beyond this there are only three recorded instances of the actual occurrence of the Red-breasted Merganser within our limits. Of these the first was that obtained by Major Yerbury at Karachi, which may be the second noted by Captain Butler. The wings of this are in the British Museum.

The second Indian specimen is that in the Indian Museum, Calcutta, an unsexed specimen obtained in the Calcutta bazaar on 17th December, 1889.

Thirdly, Major Nurse records the shooting of a young male *serrator* by Captain Macnamara, at Kush-Dil-Khan, about seven miles from Peshin, in the Quetta district. The skin, most unfortunately, was not preserved.

Nidification.—As regards the breeding habits, it is remarkable that whereas it is the exception for the goosander to make its nest on the ground, it would appear to be the rule for this bird to do so, and the exception for it to make it on trees.

Saxby, describing its nesting in the Shetlands, says that:—

"Although they often lay amongst long grass, they seem to prefer the shelter of a roof of some kind, and thus it is that the eggs are most commonly found under rocks, in rabbit-burrows, and even in crevices in old walls."

In Yarrell's 'History of British Birds,' iii, p. 288, there are the following remarks:—

"This species, Mr. Thompson says, . . . is indigenous to Iceland, nesting in islets both of marine and fresh-water loughs. Pennant has recorded its breeding in the Isle of Islay. Sir W. Jardine and Mr. Selby found nests of this species when on a fishing excursion upon Loch Awe, in Argyllshire. One of these nests was upon a small wooded island, placed among thick brushwood, under the covert of a projecting rock, and completely surrounded with nettles, long grasses, and ferns. It was carefully made of moss plucked from the adjoining rocks, mixed with the down of the bird, both in structure and materials, resembling that of the Eider Duck. It contained nine eggs, of a rich reddish yellow or fawn colour. The bird was remarkably tame, sitting until nearly taken with a small hand-net. Sir W. Jardine very kindly sent me one of these eggs for my collection; it measured $2\frac{1}{2}$ inches in length and $1\frac{3}{4}$ inches in breadth."

Dresser also says that:—

"It usually places its nest upon the ground in quiet, unfrequented places amongst the low bushes or rank herbage; occasionally it is found in the hollow of a tree. I possess a nest, which is now before me, and which is composed of moss, fine grass-bents, and very small pieces of twigs well felted together and mixed with down.

"The eggs, from eight to twelve in number, are usually deposited in June, or somewhat earlier than that."

He describes the eggs as being "a dull stone-drab or creamy-buff, with a greenish-grey tinge, and measuring approximately from 2.55 to 2.80 inches in length and 1.70 to 1.85 in breadth."

Morris, who gives a longer note on the nidification of the Red-breasted Merganser than on that of most ducks, observes:—

"These birds build, it seems, on the borders of, and small islands in, lakes, whether of fresh or salt water, and rivers, preferring such as have a growth of wood, the nests being placed a few yards from the edge, at the foot of a tree, or under the shelter of brushwood, in the midst of grass, fern, nettles, or other wild vegetation. Also in divers other situations, among stones in a hollow, on the bare ground, at the top of a tall tree, or in the deserted nest of some other bird, or in the end of a deep recess. It has been known, moreover, in a bleak and unsheltered situation, on an island in the sea, at some distance from the mainland. The materials of its composition are moss, flags, stalks, grass, small roots, and feathers, placed carelessly together, and intermixed with down of the bird, added to, it appears, as incubation advances.

"The eggs are from six or seven to nine, ten, or eleven in number, of a rich reddish yellow or brownish fawn colour. As soon as the females begin to sit, the males quit them for the season. The species appears to be late in its nidification, scarcely beginning to build before the end of May or the early part of June. The bird sits very close, and will allow herself to be trodden on before she will leave the nest."

With this summary of Morris's most writers agree, but the eggs are said to vary from five to fifteen in number, and many authors remark on the fact that the nest of this Merganser is, *comparatively*, perhaps unusually, well put together and compact. All note the curious way in which the down is felted in with the rest of the materials into the body of the nest, as well as being used as a copious lining.

It should be noted that, in Holstein, Bojé found this bird breeding in crows' old nests.

The eggs in my collection vary in length between 2·89 and 2·65 inches, and in breadth only between 1·7 and 1·76. They are very similar to the eggs of the Goosander, but are, on the whole, rather broader ovals; all are somewhat darker in colour, and two have a well-defined greenish tint. One clutch was taken on the 29th April, 1899, another on the 10th June, 1880, and the third 2nd July, 1898.

General Habits.—The habits of this bird vary little from those of the last, the main thing about it being the fact that it is more essentially a sea-bird. Like the Goosander, it generally associates in rather small flocks, but may occasionally be seen in parties numbering as many as 200 or even more.

Dresser, writing of this bird, observes:—

"In the Gulf of Bothnia, where the sea is fresh-water, I found it extremely common in the summer season, frequenting the coasts, and, less often, the inland lakes, but usually in places where the forests extended down to the shores, and frequently in localities where there are reeds or dense herbage, as is frequently the case on portions of the coast. It is a wary and shy bird, soon taking alarm, and not easy to approach within range; but I often obtained them when out very early in the morning about sunrise, when they appeared less shy than otherwise. It is a very expert diver; and on the coast of New Brunswick I observed them fishing in flocks at the

entrance of a small bay, and evidently driving the fish before them, as they formed a sort of cordon round the entrance to the bay, some diving, whilst the others remained on the surface. When pursued or threatened with danger, it usually seeks safety by diving in preference to trusting to its powers of flight. It flies with great swiftness, and I observed, when one passed at full speed near my hiding-place in the rocks, that it made a whistling sound with its wings, easily heard even at some little distance. It feeds on fish of various kinds; larvae of water-insects, worms, and it is also said to some extent frogs, form its staple food."

Naumann describes the cry as "a loud, resounding, guttural *koer-rr* or *ger-rr*," heard chiefly during flight, sometimes on rising, and the females and young are said to be more noisy than the adult males.

Like the Goosander, the Red-breasted Merganser can at will either float fairly high *on* the surface of the water, deep down *in* the water, or entirely submerge its body, leaving only its head and neck visible.

I N D E X.

Æx galericulata, 28, 65.
—, description of, 65.
—, distribution of, 67.
—, general habits of, 68.
—, nidification of, 67.
—, shooting of, 68.
Alpheraky's Swan, 22.
Anas platyrhyncha, 149, 150.
—, description of, 150.
—, distribution of, 151.
—, general habits of, 157.
—, nidification of, 152.
—, shooting of, 156, 158.
—, synonyms, 150.
Anas pæcilorhyncha haringtoni, 170.
—, description and distribution of, 170.
—, nidification and general habits of, 170, 171.
Anas pæcilorhyncha pæcilorhyncha, 160.
—, description of, 160.
—, distribution of, 161.
—, general habits of, 164.
—, nidification of, 161.
Anas pæcilorhyncha zonorhyncha, 168.
—, description of, 168.
—, distribution of, 168.
—, general habits of, 169.

Anas pæcilorhyncha zonorhyncha,
nidification of, 169.
Anatidæ, 12.
Anatinæ, 112.
Andaman Teal, 210.
Anser albifrons albifrons, 73, 84-88.
—, description of, 84.
—, distribution of, 85.
—, general habits of, 87.
—, nidification of, 86.
Anser anser, 73, 75.
—, description of, 75.
—, distribution of, 76.
—, general habits of, 79.
—, nidification of, 77.
—, shooting of, 80-81.
—, synonyms, 75.
Anser brachyrhynchus, 71, 73, 74, 93.
—, description of, 93.
—, distribution of, 94.
—, nidification of, 95.
Anser erythropus, 73, 89.
—, description of, 89.
—, distribution of, 90.
—, nidification of, 91.
—, synonyms, 73, 89.
Anser fabalis sibiricus, 99.
—, description of, 99.
—, synonyms, 99.
Anser gambeli, 85, 87.

Anser indicus, 71, 73, 101.
 —, description of, 101.
 —, distribution of, 102.
 —, general habits of, 106.
 —, nidification of, 103.
 —, synonyms, 101.
Anser neglectus, 73, 97.
 —, description of, 97.
 —, distribution of, 98.
 —, nidification of, 98.
Anser sibiricus, distribution of, 100.
 —, general habits of, 100.
 —, nidification of, 100.
Anseres, 12.
Anserinæ, 71.
Asarcornis scutulata, 28, 40, 41.
 —, description of, 41.
 —, diet of, 48.
 —, distribution of, 43.
 —, general habits of, 45.
 —, nidification of, 44.
 —, shooting of, 46, 47.
 —, synonyms, 41.

Baer's Pochard, 273-277.
Baikal Teal, 196-200.
Bar-headed Goose, 71, 101-108.
Bean-Geese, 74.
Bewick's Swan, 20.
Blue-wing Teal, 225-233.
Brahminy Duck, 139-148.
Brahminy-shooting, 145.
Branta ruficollis, 71, 109.
 —, description of, 109.
 —, distribution of, 110.
 —, nidification of, 110.
Bronze-capped Teal, 172-178.
Burmese Grey Duck, 170-171.

Casarca ferruginea, 112, 139.
 —, description of, 140.

Casarca ferruginea, distribution of, 141.
 —, general habits of, 144.
 —, nidification of, 142.
 —, shooting of, 145.
Chaulelasmus, as a table delicacy, 183-184.
Chaulelasmus streperus, 172, 179.
 —, description of, 179.
 —, distribution of, 180.
 —, general habits of, 182.
 —, nidification of, 181.
 —, shooting of, 184-186.
Chenomorphæ, 1.
Clucking-Teal, 196-200.
Comb-Duck, 30-39.
Common-Teal, 201-209.
Cotton-Teal, 57-64.
Crested Pochard, 284-290.
Cygninæ, 18.
Cygnus bewicki, 14, 20.
 —, description of, 20.
 —, distribution of, 20.
Cygnus cygnus, 14, 15.
 —, description of, 15.
 —, distribution of, 16.
 —, general habits of, 18.
 —, nidification of, 17.
 —, synonyms, 15.
Cygnus minor, 14, 22.
 —, description of, 22.
 —, distribution of, 23.
 —, synonyms, 22.
Cygnus olor, 14, 24.
 —, description of, 24.
 —, distribution of, 25.
 —, nidification of, 26.
Dafila acuta, 216.
 —, description of, 216.
 —, distribution of, 218.
 —, general habits of, 220.

Dafila acuta, nidification of, 219.
Dendrocygna fulva, 112, 115.
 —, description of, 115.
 —, distribution of, 116.
 —, general habits of, 119.
 —, nidification of, 117.
 —, synonyms, 115.
Dendrocygna javanica, 122.
 —, description of, 122.
 —, distribution of, 123.
 —, general habits of, 127.
 —, nidification of, 123.
 —, synonyms, 122.
 Dun-Bird, 259.
 Dwarf Goose, 89-92.

 Eastern Goosander, 317-327.
 Eastern Grey Duck, 168-169.
 Eastern White-Eye, 273-277.
Eunetta falcata, 112, 172.
 —, description of, 173.
 —, distribution of, 174.
 —, nidification of, 175.
 —, general habits of, 177.

 Flamingo, 1, 2-8.
 —, Lesser, 1, 9-11.
 Fuligulinæ, 248.

 Gadwall, 179-186.
 Gadwall-shooting, 184-186.
 Garganey, 225-233.
 Geese, Bean, 74.
 Geese-shooting, 80-81.
Glaucionetta clangula, 291.
 —, description of, 292.
 —, distribution of, 293.
 —, general habits of, 299.
 —, nidification of, 297.
 —, synonyms, 291.

Golden-Eye, 291-300.
 Goosander, Eastern, 317-327.
 Goose, Bar-headed, 71, 101-108.
 —, Dwarf, 89-92.
 —, Grey-Lag, 75-83.
 —, Middendorff's, 99.
 —, Pink-footed, 93-96.
 —, Red-breasted, 109-111.
 —, Spurred, 80.
 —, Sushkin's, 97.
 —, White-fronted, 84-88.
 Greater Whistling-Teal, 115-121.
 Grey Duck, 160-167
 —, Burmese, 170-171.
 —, Eastern, 168.
 Grey Lag Goose, 75-83.
 —, shooting of, 80-81.

 Lesser Flamingo, 1, 9-11.

 Mallard, 150-159.
 Mallard-shooting, 156, 158.
 Mandarin Duck, 65-70.
 Mandarin-Duck shooting, 68.
 Marbled Duck, 241.
Mareca penelope, 187.
 —, description of, 187.
 —, distribution of, 187.
 —, general habits of, 191.
 —, nidification of, 189.
Marmaronetta angustirostris, 241.
 —, description of, 241.
 —, distribution of, 242.
 —, general habits of, 245.
 —, nidification of, 243.
 —, synonyms, 241.
Merganser merganser orientalis, 316, 317.
 —, description of, 317.
 —, distribution of, 319.

Merganser merganser orientalis, general habits of, 321.
 —, nidification of, 321.
 —, synonyms, 317.

Merganser, Red-breasted, 328.

Merganser serrator, 328.
 —, description of, 328.
 —, general habits of, 332.
 —, distribution of, 329.
 —, nidification of, 331.
 —, synonyms, 328.

Merginæ, 248, 308.

Mergus albellus, 308, 309.
 —, description of, 309.
 —, distribution of, 311.
 —, general habits of, 314.
 —, nidification of, 312.

Middendorff's Goose, 99.

Mute Swan, 24-27.

Netta rufina, 249.
 —, description of, 249.
 —, distribution of, 251.
 —, general habits of, 253.
 —, nidification of, 252.
 —, synonyms, 249.

Nettion albogulare, 210.
 —, description of, 210.
 —, distribution of, 211.
 —, general habits of, 213.
 —, nidification of, 212.
 —, synonyms, 210.

Nettion crecca crecca, 195, 201.
 —, description of, 201.
 —, distribution of, 203.
 —, general habits of, 206.
 —, nidification of, 204.
 —, synonyms, 201.

Nettion formosum, 195, 196.
 —, description of, 196.

Nettion formosum, distribution of, 197.
 —, general habits of, 200.
 —, nidification of, 198.
 —, synonyms, 196.

Nettopus coromandelianus, 28, 57
 —, description of, 58.
 —, distribution of, 59.
 —, general habits of, 62.
 —, nidification of, 60.
 —, synonyms, 57.

Nukhta, 30-39.

Nyroca ferina, 248, 258, 259.
 —, description of, 259.
 —, distribution of, 260.
 —, general habits of, 263.
 —, nidification of, 261.
 —, synonyms, 259.

Nyroca fuligula, 248, 284.
 —, description of, 284.
 —, distribution of, 285.
 —, general habits of, 288.
 —, nidification of, 287.
 —, synonyms, 284.

Nyroca marila, 278.
 —, description of, 278.
 —, distribution of, 279.
 —, general habits of, 282.
 —, nidification of, 281.
 —, synonyms, 278.

Nyroca nyroca baeri, 273.
 —, description of, 273.
 —, distribution of, 274.
 —, general habits of, 276.
 —, synonyms, 273.

Nyroca nyroca nyroca, 266.
 —, description of, 266.
 —, distribution of, 266.
 —, general habits of, 270.
 —, nidification of, 268.
 —, synonyms, 266.

Oxyura leucocephala, 248, 301, 302.
 ——, description of, 302.
 ——, distribution of, 303.
 ——, nidification of, 305.
 ——, synonyms, 302.
Oxyurinæ, 301.
Phæniconaïas minor, 19.
 ——, description of, 9.
 ——, distribution of, 10.
 ——, general habits of, 11.
 ——, nidification of, 10.
 ——, synonyms, 9.
Phænicopterus antiquorum, 1, 2.
 ——, description of, 3.
 ——, distribution of, 3.
 ——, general habits of, 6.
 ——, nidification of, 4.
 ——, synonyms, 2.
 Pink-footed Goose, 93-96.
 Pink-headed Duck, 50-56.
 Pintail, 216-224.
 Plectropterinæ, 28.
 Pochard, 259.
 ——, Baer's, 273-277.
 ——, Crested or Tufted, 284-290.
 ——, Red-crested, 249.
 ——, White-eyed, 266-272.
Querquedula querquedula, 225.
 ——, description of, 226.
 ——, distribution of, 227.
 ——, general habits of, 230.
 ——, nidification of, 228.
 ——, synonyms, 225.
 Red-breasted Goose, 109-111.
 Red-breasted Merganser, 328-333.
 Red-crested Pochard, 249.
Rhodonessa caryophyllacea, 28, 50.
 ——, description of, 50.

Rhodonessa caryophyllacea, distribution of, 52.
 ——, general habits of, 54.
 ——, nidification of, 53.
 Buddy Sheldrake, 139-148.
Sarcidiornis melanota, 28, 30.
 ——, description of, 31.
 ——, distribution of, 31.
 ——, general habits of, 36.
 ——, nidification of, 34.
 ——, synonyms, 30.
 Scaup, 278-283.
 Sheldrake, 133-138.
 ——, Ruddy, 139-148.
 Sheldrake-shooting, 145.
 Shoveller, 234-240.
 Smew, 309-315.
Spatula clypeata, 234.
 ——, description of, 234.
 ——, distribution of, 236.
 ——, general habits of, 238.
 ——, nidification of, 237.
 Spot-Bill or Grey Duck, 160-167.
 Spurred Geese, 30.
 Stiff-tail Duck, 302-307.
 Sushkin's Goose, 97.
 Swan, Alpheraky's, 22.
 ——, Bewick's, 20.
 ——, Mute, 24-27.
Tadorna tadorna, 112, 133.
 ——, description of, 133.
 ——, distribution of, 134.
 ——, habits of, 137.
 ——, nidification of, 135.
 Teal, Andaman, 210.
 ——, Baikal, 196-200.
 ——, Blue-wing, 225-233.
 ——, Bronze-capped, 172-178.
 ——, Clucking, 196-200

Teal, Common, 201-209.
—, Cotton, 57-64.
—, Whistling (Greater), 115-121.
—, Whistling (Lesser or Common), 122-132.
Tealeries, 209.
Tufted Pochard, 284-290.
Whistling-Teal, Greater, 115-121.
—, Lesser or Common, 122-132.
White-Eye, Eastern, 273-277.
White-eyed Pochard, 266-272.
White-fronted Goose, 84-88.
White-headed or Stiff-tail Duck, 302-307.
White-winged Wood-Duck, 40, 41-49.
Whooper, 15-19.
Wigeon, 187-194.
Wild-Duck, Common, 150-159.
Wild-Duck-shooting, 156, 158.
Wood-Duck, White-winged, 40, 41-49.

PRESIDENT'S
SECRETARIAT
LIBRARY